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BOTANICAL SERIES

FIELD MUSEUM OF NATURAL HISTORY
FOUNDED BY MARSHALL FIELD, 1893

VOLUME XIII

FLORA OF PERU

PART VI

OCT 8 - 1936

BY
J. FRANCIS MACBRIDE
ASSISTANT CURATOR OF THE HERBARIUM, DEPARTMENT OF BOTANY

B. E. DAHLGREN
CURATOR, DEPARTMENT OF BOTANY
EDITOR

PUBLICATION 364

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FLORA OF PERU

J. Francis Macbride

RUBIACEAE. Coffee Family

By Paul C. Standley

Trees, shrubs, or herbs with stipules; leaves opposite or verticillate, entire or rarely pinnatifid; flowers small or large and showy, perfect or rarely unisexual, usually regular; calyx tube adnate to the ovary (hypanthium), the limb of the calyx usually dentate or lobate, one or more of the lobes occasionally enlarged and foliaceous; corolla gamopetalous, variable in form; stamens as many as the corolla lobes, inserted commonly in the tube or throat of the corolla, the anthers 2-celled; ovary 1–10-celled, inferior; fruit 1–10-celled, usually baccate, drupaceous, or capsular; seeds 1 to many, small or large, often winged.

The family is represented generously in most tropical regions, and it is one of the largest of the Peruvian flora. Most of the Peruvian plants of the family are confined to the eastern slopes of the Andes. Those occurring in the temperate regions belong chiefly to the genera *Galium*, *Relbunium*, and *Arcytophyllum*.

Key to the Tribes

Ovary with 3 or more ovules in each cell.

Fruit dry.

Flowers in very dense, globose heads. Plants armed with hooked spines, more or less scandent, woody . . I. *Naucleeae.*

Flowers not in dense globose heads.

Seeds winged, vertically imbricate . . . . . II. *Cinchoneae.*

Seeds not winged or, if winged, horizontal.

Corolla lobes imbricate or contorted, never valvate. IV. *Rondeletieae.*

Corolla lobes valvate.

Seeds horizontal; stipules entire or bifid; trees or large shrubs . . . . . III. *Condamineae.*

Seeds peltately attached; stipules often fimbriate; plants commonly herbs or low shrubs . . . . . V. *Hedyotideae.*

Fruit fleshy.

Corolla lobes valvate in bud ..... VI. *Mussaendeae.*

Corolla lobes imbricate or contorted in bud.

Seeds many, minute, pitted or rarely tuberculate.

VII. *Hamelieae.*

Seeds usually few and large, the testa smooth or fibrous.

VIII. *Gardenieae.*

Ovules 1 or 2 in each cell of the ovary.

Ovules 2 in each cell of the ovary. Fruit drupaceous, 5–7-celled.

IX. *Retiniphylleae.*

Ovules 1 in each cell.

Ovules pendulous.

Stamens inserted in the throat of the corolla tube.

X. *Guettardeae.*

Stamens inserted at the base of the corolla tube.

XI. *Chiococceae.*

Ovules erect or ascending.

Corolla lobes contorted ..... XII. *Ixoreae.*

Corolla lobes valvate.

Ovules affixed to the base of the ovary.

Ovary 1-celled, or 2-celled but with a very thin septum.

XIII. *Coussareae.*

Ovary with two or more cells, the septum thick.

Flowers commonly dioecious; stamens usually inserted at the base of the corolla; plants chiefly herbaceous and prostrate ..... XVI. *Anthospermeae.*

Flowers perfect; stamens inserted usually in the throat of the corolla; plants usually trees or shrubs, sometimes scandent.

Fruit drupaceous; plants not scandent.

XIV. *Psychotrieae.*

Fruit dry, dehiscent; plants scandent.

XV. *Paederieae.*

Ovules affixed to the septum. Stipules fimbriate or leaf-like; plants herbaceous or chiefly so.

Stipules fimbriate, not leaf-like ..... XVII. *Spermacoceae.*

Stipules resembling the leaves and forming whorls with them.

XVIII. *Galieae.*

I. NAUCLEEAE

A single genus in Peru.....1. *Uncaria.*

II. CINCHONEAE

Corolla lobes valvate.

Placenta pendulous from the apex of the cell; flowers in elongate spikes, the corolla small.....2. *Alseis.*

Placenta ascending or erect, or adnate to the middle of the septum; flowers not spicate.

Placenta ascending or erect from the base of the septum; plants scandent, chiefly or wholly herbaceous.....3. *Manettia.*

Placenta adnate to the middle of the septum; plants not scandent.

Leaves varnished, with a metallic appearance.
4. *Stilpnophyllum.*

Leaves not varnished, not with metallic appearance.

Flowers solitary. A low shrub; corolla with a very long and narrow tube.....5. *Lecanosperma.*

Flowers numerous, in several- or many-flowered inflorescences; trees or large shrubs.

Capsule splitting from below upward...6. *Cinchona.*

Capsule splitting from above downward.

Corolla lobes bifid; fruit dehiscing by 4 spirally coiled valves.....7. *Joosia.*

Corolla lobes entire; fruit not dehiscent by 4 spirally coiled valves.

Capsule loculicidal.....8. *Macrocnemum.*

Capsule septicidal.

Valves of the capsule bifid.....9. *Remijia.*

Valves of the capsule entire.

Capsules small, barely 1 cm. long; flowers densely clustered.....10. *Pimentelia.*

Capsules large, commonly more than 2 cm. long, often much larger; flowers rather loosely clustered and usually pediceled.
11. *Ladenbergia.*

Corolla lobes imbricate or contorted.

Calyx lobes unequal, one of them expanded into a large red limb. 12. *Capirona.*

Calyx lobes equal or nearly so, none of them expanded into a colored limb.

Corolla lobes contorted, or one external in *Calycophyllum.*

Calyx caducous; seeds not winged, bearing a tuft of hairs at one end.....13. *Hillia.*

Calyx persistent; seeds winged.

Plants epiphytic; corolla tube 6–9 cm. long; leaves fleshy. 14. *Cosmibuena.*

Plants terrestrial trees or shrubs; corolla smaller; leaves not fleshy.

Corolla lobed to the middle or more deeply. 15. *Calycophyllum.*

Corolla with short lobes much shorter than the tube.

Stamens equal, the anthers included....16. *Loretoa.*

Stamens unequal, the anthers exserted. 17. *Ferdinandusa.*

Corolla lobes imbricate.

Corolla regular, with a slender tube.....18. *Exostema.*

Corolla somewhat zygomorphic, with broad tube. 19. *Coutarea.*

III. CONDAMINEAE

Calyx lobes unequal, one of them in some of the flowers expanded into a large red limb .....20. *Pogonopus.*

Calyx lobes equal or nearly so, none of them expanded and colored.

Calyx deciduous; corolla large.....21. *Condaminea.*

Calyx persistent; flowers small.....22. *Chimarrhis.*

IV. RONDELETIEAE

Corolla lobes imbricate.

Calyx lobes unequal, one of them expanded into a large red limb. 23. *Warscewiczia.*

Calyx lobes equal or nearly so, none of them expanded into a colored limb.

Leaves densely white-tomentose beneath.....24. *Rondeletia.*

Leaves not tomentose.

Flowers in terminal trichotomous cymes. Leaves subsessile; corolla 12–15 mm. long.....25. *Dolichodelphys.*

Flowers in usually large and many-flowered panicles.

Seeds large; capsule loculicidal.....26. *Sickingia.*

Seeds small; capsule septicidal.....27. *Bathysa.*

Corolla lobes contorted.

Plants low herbs.....28. *Sipanea.*

Plants shrubs or trees.

Flowers large, the green corolla almost 5 cm. long. Plants glabrate.....29. *Macbrideina.*

Flowers small, the colored or white corolla less than 2 cm. long.

Stipules persistent, exuding resin; leaves glabrate.
30. *Elaeagia.*

Stipules caducous, not resinous; leaves densely hairy.
31. *Phitopis.*

V. HEDYOTIDEAE

Seeds angulate; plants annual.....32. *Oldenlandia.*

Seeds plano-convex; plants chiefly perennial and often suffrutescent.
33. *Arcytophyllum.*

VI. MUSSAENDEAE

Inflorescence terminal.

Flowers arranged in involucrate heads; plants epiphytic.
34. *Schradera.*

Flowers paniculate; plants not epiphytic.

Panicles spike-like; flowers small.....35. *Gonzalagunia.*

Panicles thyrsiform; flowers large.....36. *Isertia.*

Inflorescence axillary.

Plants creeping herbs. Flowers usually in dense heads.
37. *Coccocypselum.*

Plants shrubs or trees, or sometimes herbaceous and scandent.

Leaves with many close striolae in the meshes of the veins.

Inflorescences 1–3-flowered.....38. *Hippotis.*

Inflorescences few–many-flowered.

Leaves small and thin; plants much branched.
39. *Sommera.*

Leaves very large, coriaceous; plants chiefly simple or nearly so.....40. *Pentagonia.*

Leaves without striolae in the meshes of the veins. Plants scandent.....41. *Sabicea.*

VII. HAMELIEAE

Ovary 2-celled.....42. *Hoffmannia.*

Ovary 4–5-celled.

Corolla lobes contorted in bud.....43. *Bertiera.*

Corolla lobes imbricate in bud.

Corolla tubular.....44. *Hamelia.*

Corolla short-funnelform.....45. *Bothriospora.*

VIII. GARDENIEAE

Corolla somewhat irregular, the buds curved.....46. *Posoqueria.*

Corolla regular, the buds not curved.

Flowers perfect.

Inflorescences terminal or terminal and axillary.

Flowers in few- or many-flowered cymes.....47. *Tocoyena.*

Flowers mostly solitary or fasciculate.

Corolla tube equaling or scarcely exceeding the limb, usually shorter.....48. *Sphinctanthus.*

Corolla tube usually much longer than the limb.49. *Randia.*

Inflorescences lateral.

Corolla tube villous in both throat and base; stigma tapering; testa of the seeds fibrous; trees.....50. *Genipa.*

Corolla tube villous in throat or base but not in both; stigma not tapering; shrubs or small trees.

Ovary 2-celled; native species.....49. *Randia.*

Ovary 1-celled; cultivated species.....51. *Gardenia.*

Flowers dioecious.

Stipules forming a conic cap, connate into a sheath, deciduous above a circular slit, leaving a persistent basal caruncle.

Staminate flowers in cymes, the pistillate usually solitary, rarely 2–3 in a head.....52. *Duroia.*

Staminate and pistillate flowers both in cymes. 53. *Amaioua.*

Stipules free or united only near the base, not forming a cap that is dehiscent by a transverse slit.

Staminate flowers lateral; plants usually armed with spines. 49. *Randia.*

Staminate flowers terminal; plants unarmed..54. *Alibertia.*

IX. RETINIPHYLLEAE

A single genus in Peru.....55. *Retiniphyllum.*

X. GUETTARDEAE

Corolla lobes imbricate in bud.

Fruit separating into 2 narrow dry cocci.....56. *Machaonia.*

Fruit drupaceous, indehiscent.....57. *Guettarda.*

Corolla lobes valvate.

Tube of the corolla short and thick.....58. *Malanea.*

Tube of the corolla slender and elongate.

Corolla lobes corniculate outside at the apex.....59. *Chomelia.*

Corolla lobes not corniculate.....60. *Anisomeris.*

XI. CHIOCOCCEAE

A single genus in Peru.....61. *Chiococca.*

XII. IXOREAE

Calyx calyculate at the base; cultivated plants.....62. *Coffea.*

Calyx naked at the base; native plants.....63. *Ixora.*

XIII. COUSSAREAE

Seeds vertical; ovules connate, borne on a common basal column. 64. *Coussarea.*

Seeds horizontal; ovules separate in a 1-celled ovary, collateral, basilar.....65. *Faramea.*

XIV. PSYCHOTRIEAE

Ovary partly or almost wholly superior.....66. *Pagamea.*

Ovary inferior.

Flowers in elongate, interrupted spikes, crowded in dense groups at the nodes of the spikes, each group surrounded by a short involucre of united bracts.....67. *Stachyococcus.*

Flowers not in interrupted spikes.

Inflorescence an involucrate head (heads often compound in *Cephaelis*).

Plants creeping herbs; seeds flat on the ventral side. 68. *Geophila.*

Plants usually large shrubs; seeds deeply furrowed on the ventral side.....69. *Cephaelis.*

Inflorescence not involucrate, or very rarely so.

Fruiting carpels much compressed laterally, the fruit didymous; plants low, herbaceous or suffrutescent. 70. *Declieuxia.*

Fruiting carpels not compressed laterally; plants mostly trees or shrubs.

Seeds with inrolled ventral surface; stipules pectinately lobed or with setiform appendages.....71. *Rudgea.*

Seeds not with inrolled ventral surface; stipules mostly entire or bilobate.

Corolla tube straight, not gibbous at the base. 72. *Psychotria.*

Corolla tube elongate, more or less curved, gibbous at the base. Branches of the inflorescence usually red or yellow.....73. *Palicourea.*

XV. PAEDERIEAE

A single genus in Peru.....74. *Paederia.*

XVI. ANTHOSPERMEAE

Fruit leathery, pyriform, deeply costate, splitting into 2 cocci. 75. *Corynula.*

Fruit a succulent, red, berry-like drupe.....76. *Gomozia.*

XVII. SPERMACOCEAE

Flowers in panicled umbels; plants scandent.....77. *Emmeorrhiza.*

Flowers not umbellate; plants usually not scandent.

Fruit not separating into cocci, the whole fruit circumscissile. 78. *Mitracarpus.*

Fruit separating into cocci.

Cocci indehiscent.

Cocci 3–4.....79. *Richardia.*

Cocci 2.....80. *Diodia.*

Cocci, at least one of them, dehiscent.

Cocci opening only at the base. Flowers axillary.
81. *Hemidiodia.*

Cocci opening at the apex.

Cells of the fruit unlike, one opening, the other remaining closed.....82. *Spermacoce.*

Cells of the fruit alike, both opening.....83. *Borreria.*

XVIII. GALIEAE

Calyx lobes developed, lanceolate.....84. *Sherardia.*

Calyx lobes obsolete.

Flowers surrounded by a calyx-like involucre.....85. *Relbunium.*

Flowers not involucrate.....86. *Galium.*

1. UNCARIA Schreb.

Scandent or trailing shrubs, armed with stout recurved spines; stipules interpetiolar, entire or bifid; leaves opposite, petiolate; flowers sessile or pedicellate, in solitary or racemose, pedunculate, spherical heads, 5-parted; calyx tubular or funnelform, dentate; corolla funnelform, the throat glabrous, the short lobes valvate in bud; stamens inserted in the corolla throat, exserted; fruit 2-celled, dry, fusiform, septicidally bivalvate; seeds few or numerous, winged and bicaudate.

Flowers pedicellate; leaves glabrous..... *U. guianensis.*

Flowers sessile; leaves tomentulose beneath or strigose on the veins. *U. tomentosa.*

Uncaria guianensis (Aubl.) Gmel. Syst. 370. 1796. *Ourouparia guianensis* Aubl. Pl. Guian. 177. *pl. 168.* 1775.

A large shrub with scandent or recurved branches; leaves short-petiolate, the blades oblong to broadly elliptic, 6–12 cm. long, obtusely short-acuminate, truncate to obtuse at the base; flower heads 2.5 cm. in diameter; calyx 4–5 mm. long, turbinate, tomentulose; corolla white, 11 mm. long, densely pilose, the lobes obtuse; fruit 3.5–4 cm. long, glabrate. "Unganangi."

Ayacucho: Choimacota Valley, 800 meters, *Weberbauer 7537.*—Cuzco: Cosñipata, 700 meters, *Weberbauer 6953.*—Loreto: Yurimaguas, in forest, *Williams 4170, 7844.* La Campuya, *W. Fox 94.* Río Itaya, *Williams 251.* Puerto Arturo, in pasture, *Williams 5193.*

—San Martín: Tarapoto, *Williams 6525*. Bolivia to Brazil and the Guianas.

Uncaria tomentosa (Willd.) DC. Prodr. 4: 349. 1830. *Nauclea aculeata* HBK. Nov. Gen. & Sp. 3: 382. 1819, non Willd. *N. tomentosa* Willd. ex R. & S. Syst. Veg. 5: 221. 1819. *Ourouparia tomentosa* Schum. in Mart. Fl. Bras. 6, pt. 6: 132. 1889.

A large, more or less scandent shrub, armed with stout spines; leaves short-petiolate, the blades thin, oval to ovate or broadly oblong, 10–15 cm. long, acute or short-acuminate, usually pale beneath and minutely tomentulose, often glabrate and strigose on the veins; flowers whitish, fragrant, the dense heads 2 cm. in diameter; corolla 8–10 mm. long, densely tomentulose; capsule 6–8 mm. long.

Loreto: Mouth of Río Santiago, *Tessmann 4663*. Also in Colombia, the Guianas, Trinidad, and Central America.

Of the collection cited I have seen only a fragment. Evidently it represents a species distinct from *U. guianensis*, but I do not feel certain that it is *U. tomentosa*, which is not known to occur between northern Colombia and Peru.

2. ALSEIS Schott

Trees or shrubs with opposite leaves; stipules short or elongate; flowers small, white or yellow, spicate, the spikes simple or branched, axillary and terminal; hypanthium obconic; calyx 5-lobate, the lobes broad or narrow, deciduous; corolla cylindric, short, pilose within, the limb 5-lobate, the lobes valvate; stamens inserted at the base of the corolla tube, the filaments villous; capsule oblong-turbinate, 2-celled, septicidally bivalvate from the apex; seeds linear-fusiform, the testa produced at each end.

Alseis peruviana Standl. Field Mus. Bot. 11: 179. 1936.

A tree, the branchlets fulvous-hispidulous; stipules deciduous, ovate, acuminate, 1–1.5 cm. long; leaves short-petiolate, membranaceous, the blades rhombic-oblanceolate or cuneate-obovate, 21–37 cm. long, 7–18 cm. wide, acute or acuminate, long-attenuate to the base, short-pilosulous above, densely hispidulous beneath; spikes 6–17 cm. long; calyx 1.2 mm. long, glabrate, the lobes unequal, lance-oblong, acute; corolla 2.5–3 mm. long, minutely fulvous-hispidulous.

Loreto: Puerto Arturo, Yurimaguas, 200 meters, in forest, *Williams 5030*, type.—San Martín: Juan Guerra near Tarapoto, *Williams 6916*. "Mishu-quiro," "palo blanco."

3. MANETTIA L.

Plants scandent, herbaceous or suffrutescent; stipules interpetiolar, sometimes dentate or fimbriate; leaves opposite, herbaceous or coriaceous; flowers 4-parted, solitary and axillary or disposed in cymes or panicles, often brightly colored; calyx with 4 or 8 segments, these equal or unequal, persistent; corolla tubular or funnelform, the lobes valvate in bud, the tube usually pilose within above the base, the throat glabrous or villous; stamens included or exserted, the anthers linear; capsule 2-celled, septicidally dehiscent; seeds small, discoid, winged.

Calyx lobes 8, usually broad and foliaceous, united at the base into a short tube.

Leaves glabrous or practically so.

Corolla glabrous.....*M. glandulosa.*

Corolla sparsely or densely pubescent outside.

Capsule pyriform, acute at the base; leaf blades rounded at the base.....*M. tarapotensis.*

Capsule globose, rounded at the base; leaf blades acute at the base.....*M. coccinea.*

Leaves copiously pubescent beneath, at least when young.

Plants villous-pilose throughout with long, weak, shaggy hairs.

Corolla tube dilated above; calyx lobes broad; capsule globose.....*M. hispida.*

Plants short-pilose.

Corolla tube dilated above; leaves soon glabrate.
M. vacillans.

Corolla tube cylindric; leaves permanently pubescent.

Calyx lobes narrowly lanceolate, long-attenuate; capsule obovoid, acute at the base; flowers racemose.
M. racemosa.

Calyx lobes lanceolate or ovate; capsule globose, rounded at the base; flowers subumbellate.....*M. Schunkei.*

Calyx lobes 4.

Leaves tomentose beneath with matted hairs.

Calyx lobes minute, scarcely 1 mm. long.....*M. tomentulosa.*

Calyx lobes 1.5–4 mm. long.

Corolla glabrous outside.....*M. poliodes.*

Corolla villous or tomentose.

Calyx lobes triangular-ovate, 1.5–2 mm. long, in fruit as much as 4 mm.; tomentum of the lower leaf surface yellowish.....*M. peruviana.*

Calyx lobes lanceolate, 2–4 mm. long, in fruit as much as 1 cm.; tomentum whitish.....*M. Weberbaueri.*

Leaves not tomentose.

Corolla large, 3–5 cm. long.....*M. cordifolia.*

Corolla usually less than 1.5 cm. long.

Calyx lobes minute, ovate to lanceolate, erect or suberect, less than 2 mm. long, inconspicuous, never much thickened.

Young branches glabrous. Corolla tube 3 mm. long; flowers laxly paniculate.....*M. paniculata.*

Young branches pilose or villous.

Calyx lobes broadly ovate, obtuse.....*M. thysanophora.*

Calyx lobes triangular or lanceolate, acute or acuminate.

Capsule obtuse at the base; flowers racemose-paniculate. *M. veronicoides.*

Capsule acute at the base; flowers subumbellate. *M. modica.*

Calyx lobes large or elongate, usually much more than 2 mm. long, sometimes recurved, often conspicuous and leafy, frequently much thickened.

Corolla villous or pilose outside.

Tube of the corolla about 6 mm. long; leaves oblong-lanceolate.....*M. acutifolia.*

Tube of the corolla 12 mm. long; leaves elliptic. *M. asclepiadacea.*

Corolla glabrous outside.

Calyx lobes united at the base into a short tube, recurved. *M. divaricata.*

Calyx lobes free or nearly so, not recurved.

Calyx lobes ovate or orbicular, obtuse or rounded at the apex.

Corolla tube 12–14 mm. long.....*M. dubia.*

Corolla tube 5–6 mm. long.....*M. umbellata.*

Calyx lobes lanceolate or linear-lanceolate, acute or acuminate.

Leaves large, about 6 cm. wide.....*M. glandulosa.*

Leaves smaller, 3 cm. wide or less.

Calyx lobes 6–10 mm. long; leaves coriaceous.
M. Albert-Smithii.

Calyx lobes 3–3.5 mm. long; leaves thin.
M. leucantha.

Manettia acutifolia R. & P. Fl. 1: 58. *pl. 89, f. b.* 1798. *M. acutiflora* Pers. Syn. Pl. 1: 134. 1805. *Lygistum acutifolium* Kuntze, Rev. Gen. 1: 287. 1891.

A large, slender vine; stipule lobes short, acute; leaves short-petiolate, thin, the blades 1.5–3 cm. wide, long-acuminate, rounded or obtuse at the base, glabrous or nearly so; flowers congested in the leaf axils; hypanthium pilose, the calyx lobes linear-lanceolate or linear-oblong, long-attenuate, erect; corolla purple or white, densely pilose outside, the tube 6 mm. long. Neg. 218.

Cuzco(?): Type collected between Acomayo and Pati, *Ruiz & Pavón* (photo. and fragm. of authentic material seen, ex hb. Berol.).—Huánuco: Río Huallaga Canyon below Río Santo Domingo, climbing over shrubs, 1,200 meters, *Macbride 4255.*

Manettia Albert-Smithii Standl. Field Mus. Bot. 8: 151. 1930.

A scandent herb, the stems glabrous; stipules acute, sometimes fimbriate, 2–2.5 mm. long; leaves short-petiolate, coriaceous, the blades oblong-lanceolate to ovate, 1.5–3 cm. wide, acuminate, obtuse at the base, glabrous; inflorescence racemiform, the flowers short-pedicellate; hypanthium glabrous; calyx lobes erect, green, coriaceous, lanceolate, acute or acuminate; corolla white, glabrous outside, the tube 6–7 mm. long, the lobes 6–7 mm. long, long-villous within; capsule subglobose, 6–7 mm. long, obtuse or abruptly contracted at the base.

Ayacucho: Carrapa, 1,200 meters, wooded hillside, *Killip & Smith 22418*, type. Aina, 750–1,000 meters, in thickets, *Killip & Smith 23104.*

Manettia asclepiadacea Standl. Field Mus. Bot. 8: 332. 1931.

Stems retrorse-pilosulous; stipules setulose-pectinate; leaves petiolate, the blades membranaceous, elliptic, 4.5–5.5 cm. wide, long-acuminate, acute at the base, glabrous, the veins obscure, paler beneath; flowers umbellate in the leaf axils, the pedicels 5–9 mm. long; hypanthium densely pilosulous; calyx lobes lanceolate or narrowly ovate, 8–10 mm. long, green; corolla white-pilose outside, the white

tube 12 mm. long, the lobes yellow with purple tips, 4.5 mm. long; capsule obovoid, acute or attenuate at the base.

Loreto: San Antonio, Río Itaya, 110 meters, dense forest, *Killip & Smith 29476*, type. Also in Ecuador.

Manettia coccinea (Aubl.) Willd. Sp. Pl. 1: 624. 1797. *Nacibea coccinea* Aubl. Pl. Guian. 96. *pl. 37, f. 1.* 1775.

Stems usually glabrous; stipules truncate, denticulate; leaves herbaceous, petiolate, the blades lanceolate to ovate, 3–10 cm. long, acute or acuminate, acute to obtuse at the base; flowers chiefly axillary; calyx lobes 8, linear or oblanceolate, 4–14 mm. long, foliaceous, ciliate, recurved; corolla red, 17–25 mm. long, more or less pilose; capsule subglobose, 6–12 mm. long, rounded at the base.

Huánuco: Posuso, 600 meters, over sunny shrubs, *4592*.—Loreto: Between Río Nanay and Río Napo, in forest, *Williams 686*. Widely distributed in the lowlands of tropical America, ranging northward to Mexico.

Manettia cordifolia Mart. Denkschr. Acad. Muench. 9: 95. *pl. 7.* 1824. *Guagnebina ignita* Vell. Fl. Flum. 45. *pl. 115.* 1825. *M. ignita* Schum. in Mart. Fl. Bras. 6, pt. 6: 170. 1889.

A large, herbaceous vine; leaves short-petiolate, membranaceous, ovate to lance-oblong, long-acuminate, rounded or obtuse at the base, finely pubescent beneath; flowers chiefly axillary and solitary, long-pedicellate; calyx lobes 4, oblong or lanceolate, usually unequal, large and foliaceous; corolla bright red, glabrous outside, 3–5 cm. long, the tube dilated above, the lobes very short. Neg. 193.

Huánuco: Posuso, López to Cueva Blanca, *Pearce 215* (teste Wernham).—San Martín: San Roque, abandoned land, *Williams 7773, 7479*.—Department unknown: Without locality, *Weberbauer 6560; Pavón; Mathews 1343*. Andes at 1,500–2,400 meters, *Pearce 590* (teste Wernham). Bolivia to Brazil and Argentina.

Manettia cordifolia var. **attenuata** (Nees & Mart.) Wernham, Gen. Manettia 20. 1919. *M. attenuata* Nees & Mart. Act. Soc. Nat. Cur. 12: 14. 1825.

Similar to the species, but the upper leaves, at least, narrowly lanceolate or linear-lanceolate, acute at the base, finely pubescent beneath.

San Martín: Lamas, *Williams 6406*. Near Tarapoto, *Spruce 3929*. Also in Brazil.

Manettia cordifolia var. **glabra** (C. & S.) Standl. Field Mus. Bot. 7: 263. 1931. *M. glabra* C. & S. Linnaea 4: 159. 1829. *M. micans* P. & E. Nov. Gen. & Sp. 3: 24. 1845.

Like the species, but the leaves glabrous. Neg. 192.

Huánuco: Posuso, rocky wooded slopes, 600 meters, *4722.* Puerto Victoria, 300 meters, wooded river banks, *Killip & Smith 26823.*—Junín: La Merced, 600 meters, river cliffs, *5585.* Vitoc, *Ruiz.* Chanchamayo Valley, 1,800 meters, *Schunke 480, 1519, 1430.* San Ramón, 900–1,300 meters, edge of woods, *Killip & Smith 24748.* Huacapistana, *Weberbauer 1967.* La Merced, *Killip & Smith 23519.* Río Perené, 600 meters, in forest, *Killip & Smith 25213.*—Loreto: Type of *M. micans* from Yurimaguas, *Poeppig.* Yurimaguas, 135 meters, dense forest, *Killip & Smith 27990.* Balsapuerto, 220 meters, *Klug 3080.* San Lorenzo, *Killip & Smith 29200.*—Madre de Dios(?): Seringal San Francisco, Río Acre, *Ule 9864.*—San Martín: Between Moyobamba and Tarapoto, *Raimondi 490.* Tarapoto, *Mathews 1343.* Río Huallaga, *Spruce 4592.* Zepelacio, 1,200–1,600 meters, *Klug 3541.* Pongo de Cainarachi, 230 meters, *Klug 2606.* Ranging to Brazil and Argentina.

The variety is much more frequent in most parts of the range than the typical form of the species. It must be a handsome and showy plant, with its large and brilliantly colored flowers.

Manettia divaricata Wernham, Gen. Manettia 41. 1919.

A large, herbaceous vine, glabrous throughout or nearly so; stipules small and inconspicuous, deciduous; leaves slender-petiolate, blackish when dried, papyraceous, the blades elliptic to ovate-oblong, acutely acuminate, acute at the base; flowers few, axillary and solitary or in 3-flowered cymes; calyx lobes fleshy, ovate or lanceolate, acuminate, 3–5 mm. long; corolla lilac-rose or with purplish green tube and dull pink lobes, the stout tube 15 mm. long, the rather short lobes recurved; capsule large, obovoid, acutish at the base or obtuse.

Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26615.*—Loreto: Lower Río Nanay, *Williams 564.* Masisea, 275 meters, open woods, *Killip & Smith 26848.* Mishuyacu, 100 meters, in clearing, *Klug 849.* Iquitos, in forest, *Killip & Smith 29858.* Also in Bolivia.

Manettia dubia Wernham, Gen. Manettia 31. 1919.

Stipules deltoid, acuminate; leaf blades elliptic, 6.5–8.5 cm. long, obtuse or acuminate, rounded at the base, glabrous; calyx lobes

ovate-orbicular, mucronate-acute, 6 mm. long; corolla blue, glabrous outside, the tube 12–13 mm. long, the lobes 4–5 mm. long.

Ayacucho: Type from Puitac, at 3,000–3,300 meters, *Pearce.* Known to the present writer only from description.

Manettia glandulosa P. & E. Nov. Gen. & Sp. 3: 24. 1845. *Lygistum glandulosum* Kuntze, Rev. Gen. 1: 287. 1891.

Stipules deltoid, glandular-ciliate; leaves glabrous, subcoriaceous, the blades as much as 12.5 cm. long, acuminate, shining, especially beneath; peduncles axillary, 1–several-flowered; calyx lobes 4 or 8, lanceolate, half as long as the corolla; corolla small, glabrous, pink; capsule oval, didymous, glabrous.

Loreto: Type from forests of Yurimaguas, *Poeppig.* Reported by Wernham (Gen. Manettia 38. 1919) from Río Huallaga, Yurimaguas, *Spruce 3874.* Known to the present writer only from description.

Manettia hispida P. & E. Nov. Gen. & Sp. 3: 24. *pl. 228.* 1845. *Lygistum hispidum* Kuntze, Rev. Gen. 1: 287. 1891.

A large, suffrutescent vine, villous-pilose throughout with long, spreading, whitish hairs, the stems straw-colored; stipules oblong, acute; leaves on short, stout petioles, the blades broadly elliptic to oblong, acuminate, acute at the base; flowers few and axillary, long-pedicellate, often umbellate; calyx lobes 7, oval-spatulate; corolla red or pinkish red, copiously long-pilose, the tube 15 mm. long; capsule ovoid or globose, villous. Neg. 216.

Huánuco: Cerro de San Cristóbal, near Cochero, *Poeppig.*—Loreto: Yurimaguas, *Poeppig 2321* (photo. and fragm. ex hb. Berol.). Fortaleza, Yurimaguas, edge of forest, *Williams 4299.* Puerto Arturo, in forest, *Williams 5315.* Balsapuerto, 220 meters, *Klug 3024.* Santa Rosa, 135 meters, dense forest, *Killip & Smith 28906.* Yurimaguas, 135 meters, in forest, *Killip & Smith 29115.*—San Martín: Lamas, in forest, *Williams 6483.*—Department unknown: Without locality, *Poeppig 235; Pavón* (labeled "Besleria sp. nova").

Manettia leucantha Krause, Repert. Sp. Nov. 19: 308. 1924.

A slender, herbaceous vine, the stems glabrous or nearly so; stipules subulate-aristate; leaves short-petiolate, the blades lanceolate or ovate-lanceolate, 5–8 cm. long, long-acuminate, acute or obtuse at the base, glabrous; calyx lobes linear-lanceolate, acute, 3–3.5 mm. long; corolla white, the tube 4–6 mm. long, the lobes acute, slightly shorter than the tube; capsule subglobose, glabrate. Neg. 210.

Huancavelica: Río Mantaro, below Huancamayo, in forest, 1,500 meters, *Weberbauer 6573*, type collection.

Manettia modica Standl. Field Mus. Bot. 4: 275. 1929.

Suffrutescent, with stramineous branches, the young branchlets villosulous; stipules truncate, bearing a few subulate setae; leaves short-petiolate, the blades lanceolate or ovate-lanceolate, 2–3.5 cm. long, long-acuminate, obtuse at the base, sparsely villous, pale beneath, the margins revolute; flowers umbellate-paniculate, pedicellate; calyx lobes broadly ovate, acute; capsule obovoid, 5 mm. long, acute and long-attenuate at the base.

Huánuco: Vilcabamba, Río Chinchao, 1,800 meters, climbing over shrubs, *Macbride 5154*, type.

Manettia paniculata P. & E. Nov. Gen. & Sp. 3: 24. 1845. *Lygistum paniculatum* Kuntze, Rev. Gen. 1: 288. 1891.

A slender, herbaceous vine, glabrous; stipules broad, short, acutish; leaves on short, slender petioles, the blades lance-oblong, about 7.5 cm. long and 2.5 cm. wide, acuminate, acute to rounded at the base, glabrous, paler beneath; flowers arranged in lax, open panicles, the flowers long-pedicellate; calyx lobes oblong, obtuse, thick, half as long as the corolla, somewhat spreading; corolla tube 3 mm. long. Negs. 25688, 202.

Loreto: Forests of Yurimaguas, Mainas, *Poeppig 2462* (photo. and fragm. of type material, ex hb. Berol.). Wernham (Gen. Manettia 30. 1919) reports also a specimen collected by Poeppig at Casapí (Huánuco).

Manettia peruviana Standl. Field Mus. Bot. 4: 274. 1929.

A scandent shrub, the branchlets densely villous; stipules triangular, acute, 2.5 mm. long; leaves almost sessile, the blades thick, oblong-ovate, 2.5–4.5 cm. long, acute or short-acuminate, rounded at the base, scabrous and villosulous-puberulent above, densely tomentose beneath; flowers umbellate, long-pedicellate; calyx lobes triangular-ovate, 1.5–2 mm. long; corolla dark red, short-villous, the tube 8 mm. long, the obtuse lobes 2 mm. long; capsule didymous-globose, 5–6 mm. wide. "Pushpu-hoirer."

Huánuco: Mito, 2,700 meters, twining on shrubs of sunny slopes, *Macbride & Featherstone 1395*, type. Tambillo, 2,400 meters, *3571*.— Junín: Mountains west of Huacapistana, 2,400 meters, *Weberbauer 2287*.

Manettia poliodes Standl. Field Mus. Bot. 8: 151. 1930.

A large vine, the young branchlets densely villosulous-tomentose; stipules 2 mm. long, 3-denticulate; leaves short-petiolate, the blades membranaceous, ovate-elliptic or oblong-ovate, 4–8 cm. long, acuminate, rounded or obtuse at the base, green above, sparsely villosulous, densely tomentose beneath; flowers umbellate-cymose, slender-pedicellate; calyx lobes ovate, acute or acuminate; corolla violaceous, the tube 7–10 mm. long, the triangular-ovate lobes 2–2.5 mm. long; capsule subglobose, 5 mm. long, obtuse at the base.

Cuzco: Marcapata Valley, near Chilechile, 2,500 meters, in thicket, *Weberbauer 7863*, type. Below Lares, 3,100 meters, in thicket, *Weberbauer 7890*. Valle del Apurímac, Mollepata, 2,750 meters, *Herrera 1230*.

Manettia racemosa R. & P. Fl. 1: 58. *pl. 89, f. a.* 1798. *M. mutabilis* Pers. Syn. Pl. 1: 134. 1805. *Nacibea mutabilis* Poir. in Lam. Encycl. Suppl. 4: 55. 1816. *Lygistum racemosum* Kuntze, Rev. Gen. 1: 288. 1891.

A large, herbaceous vine; stipules acuminate, ciliate; leaves slender-petiolate, the blades membranaceous, ovate to elliptic-oblong, more or less villous or pilosulous, at least beneath along the nerves, acute or acuminate, acute to obtuse at the base; flowers few, cymose or axillary and short-racemose; calyx lobes usually 8, linear or lanceolate, large and elongate, herbaceous, often recurved; corolla purplish or red-violet, villous; capsule ellipsoid, sparsely villous or pilosulous, 12 mm. long, acute at the base. Neg. 221.

Huánuco: Described from Cochero, Chinchao, Cassape, Macora, Marimarchahua, and Hualqui, *Ruiz & Pavón* (photo. and fragm. seen, ex hb. Berol.).—Loreto: Mishuyacu, 100 meters, in marsh, *Klug 1164*.—Locality unknown: *Pavón; Dombey 553*.—San Martín: Zepelacio, 1,200–1,600 meters, mountain forest, *Klug 3609*.

Manettia Schunkei Standl. Field Mus. Bot. 4: 273. 1929.

Plants scandent, herbaceous or suffrutescent, the slender stems at first reflexed-hirtellous; stipules triangular, acute; leaves short-petiolate, firm-membranaceous, the blades lance-ovate or ovate-elliptic, 2.5–5.5 cm. long, acuminate, rounded or obtuse at the base, sparsely scaberulous above, densely scaberulous beneath; cymes axillary, umbelliform, the flowers slender-pedicellate; calyx lobes 8, foliaceous, lanceolate or ovate, 3–4 mm. long; corolla red, sparsely

puberulent, the tube 13 mm. long, the ovate lobes 6 mm. long; capsule small, didymous-globose, obtuse or rounded at the base.

Junín: Chanchamayo Valley, 1,200 meters, *Schunke 362*, type; at 1,200–1,500 meters, *Schunke 1428, 1461, 1444*. Colonia Perené, 600 meters, in forest, *Killip & Smith 25202*.

Manettia tarapotensis Wernham, Gen. Manettia 38. 1919.

A large, herbaceous vine, the stems puberulent; stipules truncate, glandular-denticulate; leaves slender-petiolate, the blades subcoriaceous, ovate or ovate-elliptic, acuminate, rounded at the base and abruptly contracted, glabrous, 6–9 cm. long; flowers in rather dense and many-flowered umbels, long-pedicellate; calyx lobes 8, linear, 5–6 mm. long or more; corolla puberulent, the tube 12–13 mm. long; capsule pyriform, 1 cm. long or larger, thinly tomentulose.

San Martín: Type from Tarapoto, *Spruce 4076, 4426*. Rumizapa, *Williams 6764*. Tarapoto, in forest, *Williams 6105, 6528*.

Manettia thysanophora Wernham, Gen. Manettia 28. 1919.

A rather coarse vine; stipules united, reflexed, fimbriate; leaves short-petiolate, membranaceous, the blades elliptic or broadly ovate, 3.5–5 cm. long, acuminate, acute at the base, glabrate and green above, pale beneath and when young sparsely hirtous; flowers numerous, subumbellate in the axils, slender-pedicellate; calyx lobes 4, broadly ovate, usually obtuse, glabrous, 1 mm. long; corolla glabrous outside, the tube 5 mm. long, the lobes 2 mm. long.

Peru, without locality, *Mathews 1501*, type collection.

Manettia tomentulosa Standl. Field Mus. Bot. 4: 273. 1929.

Young branchlets densely puberulent or short-villous; stipules subtruncate, laciniate-dentate; leaves petiolate, thick-membranaceous, the blades oblong-ovate to lance-oblong, 3–7 cm. long, acuminate, rounded or obtuse at the base, sparsely appressed-pilose above or glabrate, minutely and densely tomentulose beneath; flowers in axillary umbels, slender-pedicellate; capsule subglobose, 3.5 mm. long, minutely puberulent, rounded at the base; calyx lobes oblong or ovate, obtuse.

Junín: La Merced, 1,200 meters, climbing over bushes, *Macbride 5772*, type. Huacapistana, 1,800–2,400 meters, in thickets, *Killip & Smith 24141*.

Manettia umbellata R. & P. Fl. 1: 58. *pl. 90, f. a.* 1798. *Lygistum umbellatum* Kuntze, Rev. Gen. 1: 288. 1891.

A large, glabrous vine, herbaceous or suffrutescent; stipules short, triangular-apiculate; leaves short-petiolate, subcoriaceous, the blades ovate to oblong or elliptic, acuminate, obtuse or rounded at the base; flowers umbellate or short-racemose in the leaf axils, slender-pedicellate; calyx lobes 4, ovate, obtuse or acute, thick; corolla blue, glabrous, the stout tube 6–7 mm. long, the lobes short, triangular-ovate; capsule globose-ovoid, 7 mm. long. Neg. 199.

Ayacucho: Choimacota Valley, 2,800 meters, *Weberbauer 7572.*—Huánuco: Described from Muña, *Ruiz & Pavón* (photo. and fragm. of authentic material seen, ex hb. Berol.; labeled as from Parrasahuas). Vilcabamba, 1,800 meters, *5153*. Panao, 2,700 meters, a vine over shrubs, *3614*. Pampayacu, *Kanehira 104.*—Madre de Dios: Seringal San Francisco, Río Acre, *Ule 9863*.

Manettia vacillans Standl. Field Mus. Bot. 4: 272. 1929.

Scandent, suffrutescent, the young branchlets densely puberulent; stipules acute, 2 mm. long; leaves short-petiolate, membranaceous, the blades elliptic or broadly ovate, 2.5–3.5 cm. long, short-acuminate, rounded or obtuse at the base, sparsely appressed-pilose above at first, beneath sparsely tomentulose on the veins or almost glabrous; inflorescences subumbellate, axillary, few-flowered; hypanthium tomentulose; calyx lobes unequal, lanceolate or ovate, 2.5–5 mm. long, acuminate, spreading or recurved; corolla reddish white, turning rose, the tube 11–12 mm. long, the ovate, obtuse lobes 3–5 mm. long.

Ayacucho: Mountains northeast of Huanta, 3,100 meters, moist ravine, *Weberbauer 7509*, type.

Manettia veronicoides Standl. Field Mus. Bot. 4: 272. 1929.

A slender vine, the young stems sparsely puberulent; stipules broadly triangular, acuminate; leaves almost sessile, the blades ovate or ovate-lanceolate, 2.5–4.5 cm. long, long-acuminate, rounded or obtuse at the base, glabrous above, sometimes tomentulose beneath along the nerves; flowers umbellate-paniculate, short-pedicellate; calyx lobes oblong-triangular, acute, 1–1.5 mm. long; corolla glabrous, the tube 2.5 mm. long, the lobes of the same length; capsule obovoid-globose, 3–4 mm. long, obtuse at the base.

Cuzco: Between the tambos Tres Cruces and Tambomayo, 2,400 meters, *Weberbauer 6971*, type.

Manettia Weberbaueri Krause, Repert. Sp. Nov. 19: 309. 1924.

Stipules acuminate; leaves short-petiolate, the blades lance-oblong to ovate or elliptic, 2–4 cm. long, short-acuminate, acute or

acutish at the base, sparsely appressed-pilose or glabrate above, pale-tomentose beneath; flowers loosely cymose; calyx lobes lanceolate or ovate-lanceolate, acute, pilose, at first 2–4 mm. long, later accrescent; corolla pink, the tube 6–9 mm. long, appressed-pilose, the lobes 2–2.5 mm. long; capsule subglobose, 5 mm. long, broadly obtuse at the base, sparsely pilose or almost glabrous. Neg. 222.

Cajamarca: San Pablo, 2,400–2,700 meters, *Weberbauer 3808*, type collection (photo. and fragm. seen, ex hb. Berol.).

4. STILPNOPHYLLUM Hook. f.

Glabrous shrubs; stipules caducous; leaves opposite, petiolate, coriaceous; flowers small, in small, axillary panicles, 5-parted; calyx cupular, 5-dentate, eglandular, persistent; corolla campanulate-funnelform, coriaceous, the tube villous within at the base, the lobes half as long as the tube, valvate in bud; stamens inserted in the corolla throat, the anthers linear; ovary 2-celled, with numerous ovules in each cell.—The genus consists of a single species.

Stilpnophyllum lineatum Hook. f. Icon. Pl. *pl. 1147*. 1873; Schum. in Mart. Fl. Bras. 6, pt. 6: 158. *pl. 111, f. 2*. 1889. *Elaeagia lineata* Spruce ex Schum. loc. cit.

A shrub 3 meters high; leaf blades oblong-lanceolate or obovate-oblong, 5–9 cm. long, short-acuminate, acute at the base, lustrous; panicles 2 cm. long, much shorter than the leaves; hypanthium turbinate; calyx 1 mm. long, the teeth ovate-triangular, minutely pilosulous; corolla 5–6 mm. long, minutely puberulent, the lobes oblong, acute, recurved.

San Martín: Summit of Cerro Pelado near Tarapoto, *Spruce 4568*, type collection.

5. LECANOSPERMA Rusby

Stiff, much branched shrubs; stipules short, persistent; leaves opposite, small, short-petiolate; flowers terminal, solitary; calyx 5-parted, the lobes narrow, foliaceous; corolla salverform, with a slender, elongate tube and broad, spreading lobes, the tube villous within at the insertion of the stamens; stamens inserted in the throat of the corolla, the anthers sessile; capsule subglobose, loculicidally bivalvate; seeds rather few, compressed, imbricate, narrowly winged. —The genus consists of a single species.

Lecanosperma lycioides Rusby, Bull. Torrey Club 20: 431. *pl. 168*. 1893.

A dense shrub 2 meters high or less, the branchlets often subspinose; leaf blades elliptic-oblong, 3–12 mm. long, glabrous or nearly so; corolla white, the tube nearly 2 cm. long; capsule 6 mm. long.

Apurímac: Between Amorayana and Sañaica, 2,700 meters, *Weberbauer 7174*. Also in Bolivia.

6. CINCHONA L.

Trees or shrubs, glabrous or variously pubescent; stipules large, distinct, caducous; leaves opposite, petiolate; inflorescence terminal, paniculate, with opposite branches, usually many-flowered; flowers 5-parted; calyx campanulate, dentate or lobate; corolla salverform, pubescent outside, the spreading lobes valvate in bud, more or less villous within along the margins; stamens semi-exserted or included, with short or elongate filaments, the anthers linear; capsule ovoid or oblong to subcylindric, bisulcate, dehiscent from the base to apex, many-seeded; seeds broadly winged.

The genus contains some of the most important drug plants of the world, the source of quinine, the universal remedy for malaria. In former years large amounts of cinchona bark were exported from Peru as well as from other regions of the Andes, particularly Bolivia and Ecuador. The gathering of the bark involved the destruction of the trees, and the supply of wild trees was finally almost exterminated. The greater part of the quinine now used in medicine is obtained from trees cultivated in the East Indies.

There is a vast literature relating to the taxonomy and economic applications of the genus. Those interested particularly in medicinal properties of the plants made intensive studies of them, describing a great number of forms as species. Many forms of the trees were distinguished by the men who collected the bark, and various races that differ but slightly in characters of foliage and flowers seem to vary greatly as to their quinine content. Because of the large number of names concerned, the synonymy of the genus is exceedingly involved. The differences between the supposed species are poorly marked and imperfectly understood, or perhaps rather confused by the excess of attention paid to the forms. It is, therefore, discouraging to attempt to present a reasonable account of the species.

The following enumeration of the *Cinchona* species is far from satisfactory, but it will perhaps permit a sufficiently fine segregation of the species. The greater number of the names in the genus relate to forms of *C. officinalis* and *C. pubescens*. The species vary greatly,

but even after the examination of a large amount of authentic material of their segregates, it does not seem possible to recognize more than a few true species in the genus. The writer believes that the greater part of the names published under the genus pertain to forms of scarcely or not at all more significance botanically than horticultural varieties of common garden vegetables.

Because of the involved synonymy, it is by no means certain that all the names listed below are correctly placed. The most of them, however, are of little importance, and it matters little what disposal is made of them.

Leaves hirsute, hispid, or hispidulous beneath, at least on the costa and nerves, the hairs stiff and spreading.

Leaves firm-membranaceous or subcoriaceous, usually dull, hirsute or hispidulous beneath over the whole surface.

Leaves glabrate on the upper surface, long-hirsute beneath. *C. Humboldtiana.*

Leaves appressed-pilose or glabrate on the upper surface, densely short-pilose beneath..... *C. Delessertiana.*

Leaves mostly thick-coriaceous, lustrous, hirsute or hispid chiefly on the costa and nerves.

Calyx 1.5–2 mm. long, densely appressed-pilose. *C. glandulifera.*

Calyx 4–5 mm. long, glabrous or glabrate..... *C. hirsuta.*

Leaves glabrous beneath, or pilosulous or villosulous with weak or short, often appressed hairs, never hirsute or hispid.

Corolla 14–17 mm. long; leaves mostly firm-coriaceous, relatively small..... *C. officinalis.*

Corolla 6–12 mm. long; leaves comparatively thin and large.

Corolla 10–12 mm. long; leaves usually copiously pubescent beneath..... *C. pubescens.*

Corolla 6–8 mm. long; leaves glabrous or glabrate beneath except along the costa.

Calyx lobes linear-subulate..... *C. amazonica.*

Calyx lobes deltoid..... *C. micrantha.*

Cinchona amazonica Standl. Field Mus. Bot. 8: 334. 1931.

A medium-sized tree; leaves petiolate, the blades thick-membranaceous, obovate-elliptic, 15–25 cm. long, 8–12 cm. wide, obtuse or acutish and abruptly short-acuminate, narrowed to the base,

glabrous above, beneath sparsely and minutely sericeous or almost glabrous; panicle large and broad, the branches densely puberulent or sericeous, the flowers mostly sessile; hypanthium densely sericeous; calyx 5-parted, 1.5–2 mm. long, minutely sericeous, the lobes linear-attenuate; corolla 3.5–4 cm. long, densely tomentulose, the lobes equaling the tube.

Loreto: Pebas, on the Amazon, *Williams 1747*, type. Also in adjacent Brazil.

Cinchona carabayensis Wedd. Ann. Sci. Nat. III. 10: 9. 1848. *C. Pahudiana* Howard, Nueva Quinol. Pav. *pl. 21*. 1862. *C. carabayensis* var. *lanceolata* Miq. Ann. Mus. Bot. Lugd. Bat. 4: 270. 1868–69. (?) *C. Hasskarliana* Miq. op. cit. 4: 266. 1868–69.

A shrub 1–3 meters high, the trunk 3–4 cm. thick; stipules obovate-oblong, much longer than the petioles; leaf blades ovate-elliptic or lanceolate, 8–12 cm. long, 4–7 cm. wide, acute at each end or rarely obtuse, coriaceous, glabrate above, pubescent-tomentose beneath; calyx teeth triangular-lanceolate, acute; capsule oblong-lanceolate or ovate-lanceolate, pubescent.

Puno: Described from thickets on the summits of the mountains between the valleys of the Province of Carabaya, especially near San Juan del Oro. Formerly, at least, planted in Java as a source of quinine.

Weddell did not describe the flowers of this species, and its position is consequently uncertain. It may be only a form of *C. officinalis*, although in that species the leaves ordinarily are nearly glabrous. Weddell states that the plant is called "cascarilla de las lomas," and that it probably withstands a greater degree of cold than any other member of the genus.

Schumann in the Flora Brasiliensis (6, pt. 6: 141. *pl. 97*) describes and illustrates *C. carabayensis*, but since the writer has seen no material of the species, even with his account of it there is difficulty in placing the plant. If his description of the flowers is correct, the species is close to *C. pubescens*, differing principally in its smaller leaves.

Cinchona coronulata Miq. Journ. Bot. Neerl. 1: 140. 1861.—Described from Peru, but of uncertain status.

Cinchona Delessertiana, Standl., sp. nov.

Ramuli crassi obtuse tetragoni densissime brunneo-pilosi, internodiis elongatis; stipulae late ovali-ovatae 12 mm. longae deciduae

obtusae extus densiuscule hispidulae intus glabrae, erectae; folia mediocria petiolata subcoriacea, petiolo crasso 1–2 cm. longo densissime pilis brunnescentibus hispidulo-tomentoso; lamina ovalis ad rotundato-elliptica 6.5–17 cm. longa 5–8.5 cm. lata apice rotundata vel obtusa et subapiculata, basi truncata vel late rotundata, supra primo sparse adpresso-pilosa cito glabrata nervis nervulisque profunde impressis, subtus undique pilis brevibus patentibus brunnescentibus vel flavidis dense hispidula, costa crassa elevata, nervis lateralibus utroque latere circa 14 prominentibus fere rectis, infimis angulo recto superioribus angulo paullo angustiore divergentibus, venulis paucis elevatis laxe reticulatis; inflorescentiae terminales et ex axillis superioribus nascentes densissime multiflorae longe pedunculatae basi foliaceo-bracteatae, floribus dense aggregatis sessilibus, bracteis ultimis linearibus vel lanceolatis 5–8 mm. longis; hypanthium 2.5 mm. longum dense fulvo-tomentosum; calyx 3–3.5 mm. longus dense adpresso-hispidulus, ad medium dentatus, dentibus triangularibus erectis acutis; corolla aperta non visa, in alabastro fere 1 cm. longa dense fulvo-strigosa; capsula immatura anguste lanceolato-oblonga 1.5 cm. longa sparse fulvo-hispidula.

Amazonas: Chachapoyas, *Mathews* (Herb. Delessert, type).

In a genus in which very numerous species have been described, based upon differences of slight importance, a group to which much attention has been given because of its economic importance, it is surprising to discover a form so conspicuously distinct from other species of the genus as this. It is hard to understand why this Mathews collection, made long ago, has not been named, but I can find no mention of it in literature. The species is a well-marked one, characterized by the very dense pubescence of short, spreading hairs that covers all parts of the plant.

Cinchona glandulifera R. & P. Fl. 3: 1. *pl. 224.* 1802. *C. undulata* Pavón ex Howard, Ill. Nueva Quinol. Pav. 2. *pl. 6.* 1862.

A shrub 2–4 meters high with 2–4 trunks, these as much as 7 cm. thick; bark ashy gray, the branchlets pilose or hirsute; stipules oblong, obtuse or acutish, villous; leaves short-petiolate, the blades ovate-lanceolate to lanceolate or oblong-elliptic, 8–12 cm. long, acute at each end, glabrous and shining above, hirsute beneath, especially on the nerves, the hairs somewhat glandular at the base; panicles leafy, terminal and axillary, many-flowered, the flowers short-pedicellate; calyx lobes subulate, short, both calyx and hypanthium densely pilosulous; corolla pinkish white, 6–7 mm. long, tomentose outside; capsule oblong, 1.5 cm. long. Neg. 102.

Huánuco: Described from the mountains of Chicoplaya, *Ruiz & Pavón;* photo. and fragm. of authentic material seen ex hb. Berol., also material in hb. Deless. Reported also from Monzón, Panatahuas, and Cochero. "Cascarilla negrilla."

Cinchona govana Miq. Journ. Bot. Neerl. 1: 140. 1861.—The status of this species, described from the Department of Puno, is uncertain.

Cinchona hirsuta R. & P. Fl. 2: 51. *pl. 192.* 1799. *C. pubescens* var. *hirsuta* DC. Prodr. 4: 353. 1830. *C. pelalba* Pavón ex DC. Bibl. Univ. 41: 152. 1829. *C. pubescens* var. *heterophylla* DC. Prodr. 4: 118. 1830. *C. heterophylla* Pavón ex DC. loc. cit. in syn.

A slender tree 4–5 meters high, the trunks usually several, commonly 15 cm. or less in diameter; leaves on stout petioles, the blades ovate or ovate-elliptic, 6–10 cm. long, obtuse, cuneate to obtuse or rounded at the base, shining above, more or less hirsute beneath; panicles corymbiform, usually rather few-flowered, but sometimes many-flowered, the branches pubescent; calyx deeply lobate, the lobes linear-lanceolate, glabrate; corolla purplish, as much as 2 cm. long, tomentulose; capsules about 3 cm. long (described by Weddell as 10–14 cm., probably in error), ovoid-oblong, Negs. 91, 94, 95, 98.

Huánuco: Described from the mountains near Pillao and Acomayo, *Ruiz & Pavón;* authentic material seen in hb. Deless., also photo. and fragm. ex hb. Berol. Authentic material of *C. pelalba* and *C. heterophylla* represented in hb. Field Mus. by photos. and fragm. ex hb. Berol. "Cascarilla delgada," "cascarilla delgadilla."

Cinchona Humboldtiana Lamb. Ill. Cinch. 7. 1821. *C. villosa* Pavón ex Lamb. loc. cit. in syn. *C. conglomerata* Pavón ex Howard, Ill. Nueva Quinol. Pav. *pl. 15.* 1862. *C. Humboldtiana* var. *conglomerata* Wedd. Ann. Sci. Nat. V. 12: 45. 1869.

Branchlets pilose or hirsute; leaves short-petiolate, the blades rather thin, elliptic to lance-oblong, 8–13 cm. long or larger, acute or acutish at each end, glabrate above, long-hirsute beneath; panicles mostly small and rather dense, pilose; calyx small, shallowly lobate, the lobes broadly triangular, acute, the hypanthium densely tomentose; corolla 1 cm. long; capsule ovate or oblong, 1.5–2.5 cm. long, tomentose-pilose or glabrate. Negs. 101, 105.

Cajamarca: Type from Jaén, *Pavón;* photo. of authentic specimen seen, ex hb. Berol. Also in Bolivia, and perhaps in Ecuador. "Cascarilla colorada."

In the herbarium of Field Museum there is a photograph of a specimen in hb. Berol, "*Kunth 23*," from Jauja, Junín, labeled *Cinchona purpurascens* Wedd., that may be referable to this species.

Cinchona legitima Ruiz ex Lamb. Bull. de Pharm. 293. 1810. —Described from Peru; a species of uncertain position.

Cinchona micrantha R. & P. Fl. 2: 52. *pl. 194*. 1799. *C. affinis* Wedd. Ann. Sci. Nat. III. 10: 8. 1848. *C. micrantha* var. *rotundifolia* Wedd. Ann. Sci. Nat. III. 11: 270. 1849. *C. micrantha* var. *oblongifolia* Wedd. loc. cit. *C. Reicheliana* Howard, Nueva Quinol. Pav. *pl. 5*. 1862. *C. micrantha* var. *huanucensis*, *C. micrantha* var. *affinis*, *C. micrantha* var. *Reicheliana*, *C. micrantha* var. *calisayoides* Howard, op. cit. 1862. *C. Pavoniana* Kuntze, Monogr. Cinch. 29. 1878.

A medium-sized tree, the branchlets sericeous or glabrate; stipules ovate, obtuse, glabrous; leaves petiolate, large, oval to obovate, rounded, or elliptic, obtuse to rounded at the apex, acute to rounded at the base, nearly glabrous but usually pilose beneath along the costa; panicles large and many-flowered, rather open, puberulent or tomentulose, often leafy; hypanthium minutely tomentulose; calyx minute, the teeth acute, purplish; corolla pink, about 6 mm. long, densely tomentulose, the lobes much shorter than the tube; capsule oblong, acute, about 1.5 cm. long. Negs. 108, 109.

Huánuco: Type from San Antonio de Playa Grande, *Tafalla;* photo. and fragm. of authentic material seen, ex hb. Berol. Type of *C. Reicheliana* from the region of Huánuco. Cochero, *Poeppig 1339, 1737, 1708*.—Cajamarca: Valley of Río Tabaconas, 1,200 meters, *Weberbauer 6271*.—Junín: La Merced, 1,000 meters, *Weberbauer 1843*. San Ramón, 900–1,300 meters, edge of woods, *Killip & Smith 24767*.—San Martín: Zepelacio, 1,100 meters, *Klug 3650*. —Without locality: *Mathews 1953; Poeppig 3047, 1707, 2834*. Reported by Weddell from Carabaya, Department of Puno. The type of *C. affinis* is from Peru. Also in Bolivia and Ecuador. "Cascarilla provinciana," "cascarilla provinciana blanquilla," "cascarilla provinciana negrilla," "motosolo." "Quepo cascarilla," "cascarilla verde" (Bolivia).

Weddell states that immediately after the bark is removed from the tree it assumes a blood-red color, and that it is exceedingly bitter. This species was formerly a more or less important source of the drug cinchona.

Cinchona officinalis L. Sp. Pl. 172. 1753. *C. lancifolia* Mutis, "Periódico de Santa Fe," 465. 1793. *C. nitida* R. & P. Fl. 2: 50. *pl. 191.* 1799 (type from Pampamarca, Chacahuassi, Casape, Casapillo, Cayumba, Sapan, Cochero, *Ruiz & Pavón;* authentic material seen ex hb. Berol. and hb. Deless.). *C. lanceolata* R. & P. Fl. 2: 51. 1799 (described from Muña, Panao, Pillao, Cochero, *Ruiz & Pavón;* authentic material seen, ex hb. Berol. and hb. Deless.); 3: 1. *pl. 223.* 1802. *C. angustifolia* Ruiz, Quinol. Suppl. 14. 1801. *C. Condaminea* H. & B. Pl. Aequin. 1: 33. *pl. 10.* 1808. *C. colorata* Lamb. Bull. de Pharm. 294. 1810. *C. Condaminea* var. *lanceolata* Lamb. Ill. Cinch. 2. 1821. *C. stupea* Pavón ex Lamb. loc. cit. in syn. 1821; Lindl. Fl. Med. 416. 1838. *C. lancifolia* var. *nitida* R. & S. Syst. Veg. 5: 9. 1825. *C. lancifolia* var. *lanceolata* R. & S. loc. cit. *C. macrocalyx* DC. Bibl. Univ. 41: 150. 1829 (authentic material seen, ex hb. Deless.). *C. coccinea* Pavón ex DC. Prodr. 4: 353. 1830, in syn. (authentic material seen, ex hb. Deless.). *C. macrocalyx* var. *obtusifolia* DC. loc. cit. *C. obtusifolia* Pavón ex DC. loc. cit. in syn. (authentic material seen, ex hb. Deless.). *C. macrocalyx* var. *lucumifolia* DC. loc. cit. *C. lucumifolia* Pavón ex DC. loc. cit. in syn. (authentic material seen, ex hb. Deless.). *C. macrocalyx* var. *Uritusinga* DC. loc. cit. *C. Uritusinga* Pavón ex DC. loc. cit. in syn. *C. Bonplandiana* Klotzsch in Hayne, Arzneigew. 7: *pl. 37.* 1846 (photo. of authentic material seen, ex hb. Berol.). *C. Calisaya* Wedd. Ann. Sci. Nat. III. 10: 6. 1848. *C. amygdalifolia* Wedd. loc. cit. (described from Bolivia and Peru). *C. boliviana* Wedd. op. cit. 7. 1848. *C. Calisaya* var. *Josephiana* Wedd. Ann. Sci. Nat. III. 11: 269. 1849. *C. Condaminea* var. *lanceolata* Wedd. loc. cit. *C. crispa* Tafalla ex Howard, Nueva Quinol. Pav. *pl. 2.* 1862. *C. Palton* Pavón ex Howard, op. cit. *pl. 13.* 1862. *C. parabolica* Pavón ex Howard, op. cit. *pl. 16.* 1862. *C. violacea, C. suberosa* Pavón ex Howard, loc. cit. 1862. *C. officinalis* var. *Uritusinga* Howard, Rept. Internat. Bot. Congr. 201. 1866. (?)*C. euneura* Miq. Ann. Mus. Bot. Lugd. Bat. 4: 265. 1868–69 (type from Río Grande, Carabaya, Department of Puno, *Hasskarl*). *C. lucumifolia* var. *stupea* Wedd. Ann. Sci. Nat. V. 11: 358. 1869. *C. Calisaya* var. *boliviana* Wedd. Ann. Sci. Nat. V. 12: 55. 1869. *C. elliptica* Wedd. op. cit. 60. 1869 (type from Province of Carabaya, Department of Puno). *C. Weddelliana* Kuntze, Monogr. Cinch. 29. 1878. *Hindsia subandina* Krause, Bot. Jahrb. 40: 431. 1908, nomen.

A large or medium-sized tree or sometimes only a shrub, the trunk rarely as much as 1.5 meters in diameter, the bark rugose,

fuscous, the branchlets strigillose-pilosulous; stipules lanceolate or oblong, acute or obtuse, glabrous; leaves petiolate, lanceolate to elliptic or ovate, small, acute, acuminate, or obtuse, at the base rounded to attenuate, coriaceous, glabrous above and often lustrous, glabrous beneath or puberulent or short-pilose, especially on the veins, usually about 10 cm. long and 3.5–4 cm. wide, often scrobiculate beneath; panicles terminal, leafy, rather small and dense, many-flowered; hypanthium strigose; calyx glabrous or nearly so, reddish, the teeth triangular, acute; corolla pink or red, sericeous, the lobes ovate, acute, the tube about 1 cm. long; capsule oblong, commonly 1.5–2 cm. long, glabrate. Negs. 96, 110, 112, 114–121, 572.

Amazonas: Reported from Chachapoyas.—Huánuco: Pampayacu, *Kanehira 352.* Pan de Azúcar, *Sawada 69, 72.*—Junín: Jaén, *Rivera 588.*—Loreto: Canela Ucsha, 1,000 meters, *Ule 6767* (type of *Hindsia subandina*).—Puno: Reported from the Sandía Valley.—San Martín: Monte Campana near Tarapoto, *Spruce 4832* (det. doubtful). Reported to grow at 1,600–2,700 meters. Ranging from Bolivia to Colombia. "Cascarilla verde," "cascarilla verde morada," "cascarilla crespilla," "cascarilla calisaya," "ichu cascarilla."

This species was formerly an important source of cinchona bark in the Andean region, and it was also the one first used in medicine. It was first made known from the region of Loja, in southern Ecuador. The species as treated here is a variable one, at least as regards leaf form, but no clear lines can be drawn to separate the forms into groups. It may well be, however, that with ample material available for study, if it ever can be brought together, there may be found some means of distinguishing several species in the material now referred to *C. officinalis.*

Cinchona pubescens Vahl, Skrivt. Naturh. Selsk. 1: 19. 1790. *C. Morado* Ruiz, Quinol. 67. 1792. *C. purpurea* R. & P. Fl. 2: 52. *pl. 193.* 1799 (type from Pati, *Ruiz & Pavón;* authentic material seen, ex hb. Berol. and hb. Deless., from Chinchao, Pillao, etc.). *C. ovata* R. & P. op. cit. 52. *pl. 195.* 1799 (described from Posuso and Panao; authentic material seen, ex hb. Berol.). *C. grandifolia* Mutis ex Humb. Ges. Naturf. Freund. Berlin Mag. 1: 117. 1807. *C. scrobiculata* H. & B. Pl. Aequin. 1: 165. *pl. 47.* 1808 (type from Jaén, Department of Junín, *Humboldt & Bonpland;* type material seen in hb. Deless.). *C. rotundifolia* Pavón ex Lamb. Ill. Cinch. 5. 1821. *C. pubescens* var. *ovata* DC. Prodr. 4: 353. 1830. *C. pallescens* Ruiz ex DC. loc. cit. in syn. *C. tenuis* Ruiz ex DC. loc. cit. in syn. *C. dis-*

color Hayne, Arzneigew. 14: sub *pl. 14*. 1846. *C. Delondriana* Wedd. Ann. Sci. Nat. III. 10: 7. 1848 (type from Peru). *C. rufinervis* Wedd. op. cit. 8. 1848 (type from Peru). *C. Pelletieriana* Wedd. loc. cit. 1848 (described from Bolivia and Peru). (?) *C. purpurascens* Wedd. loc. cit. 1848 (described from Bolivia and Peru). *C. scrobiculata* var. *genuina* Wedd. Ann. Sci. Nat. III. 11: 270. 1849. *C. scrobiculata* var. *Delondriana* Wedd. loc. cit. 1849. *C. pubescens* var. *purpurea* Wedd. loc. cit. 1849. *C. ovata* var. *vulgaris* Wedd. loc. cit. 1849. *C. ovata* var. *erythroderma* Wedd. loc. cit. 1849, nomen nudum. *C. Lechleriana* Schlecht. Linnaea 26: 728. 1853–55 (type from Sangabán, Department of Puno, *Lechler 2347;* type material seen in hb. Deless.). *C. succirubra* Pavón ex Klotzsch, Abh. Akad. Berl. 1857: 60. 1858 (type material (?) seen in hb. Berol., from Tucora in the hills of San Antonio). *C. lutea* Pavón ex Howard, Nueva Quinol. Pav. *pl. 14* 1862. *C. obovata* Pavón ex Howard, op. cit. *pl. 18*. 1862 (type from region of Huánuco, *Pavón*). *C. decurrentifolia* Pavón ex Howard, op. cit. *pl. 23*. 1862. *C. peruviana* Howard, op. cit. *pl. 27*. 1862 (type from Cochero). *C. subcordata* Pavón ex Howard, loc. cit. 1862. *C. viridiflora* Pavón ex Howard, loc. cit. 1862. *C. subsessilis* Miq. Ann. Mus. Bot. Lugd. Bat. 4: 272. 1868–69 (type from Peru, *Hasskarl*). *C. caloptera* Miq. op. cit. 273. 1868–69 (grown in Java from Peruvian seed). *C. erythroderma* Wedd. Ann. Sci. Nat. V. 11: 362. 1869 (type from Río Vilcomayo north of Cuzco). *C. platyphylla* Wedd. loc. cit. 1869. *C. elliptica* Wedd. Ann. Sci. Nat. V. 12: 60. 1869. *C. Howardiana* Kuntze, Monogr. Cinch. 30. 1878.

A medium-sized tree, the trunk about 30 cm. in diameter, the branchlets pubescent; stipules large, ovate, obtuse or acute, sericeous or almost glabrous; leaves slender-petiolate, the blades usually large, commonly broadly ovate to orbicular, rounded to acute at the apex, cordate to acute at the base and often decurrent, usually glabrate above, beneath densely short-pilose or tomentose to glabrate, often scrobiculate; panicles usually large, often leafy, many-flowered, open, the flowers subsessile; hypanthium densely sericeous; calyx appressed-pilosulous, the teeth short and broad, acute; corolla red or pink, sericeous, 10–12 mm. long, the lobes half as long as the tube; capsule lanceolate or oblong, glabrate, commonly 1.5–2.5 cm. long. Negs. 93, 103, 106, 107, 571, 22802.

Cajamarca: Huambos, 2,400 meters, *Weberbauer 4202, 4195.*—Cuzco: San Miguel, Urubamba Valley, 1,800 meters, *Cook & Gilbert 1173, 1781.* Torontoy, 2,400 meters, *Cook & Gilbert 1099.*—Huánuco: Pan de Azúcar, *Sawada 75.* Río Posuso, 2,300 meters, *Weberbauer*

6782. Casapí, *Mathews 1952.*—Junín: Jaén, *Bonpland.* Chanchamayo Valley, 1,600 meters, *Schunke 1490, 546.*—Puno: Mountains near Sangabán, *Lechler 2347.* Province of Carabaya, *Weddell 4353.* Bolivia to Colombia. "Cascarilla," "cascarilla boba," "cascarilla delgada," "cascarilla pata de gallinazo," "cascarilla fina," "cascarilla morada," "cascarilla pata de gallareta," "palo blanco," "quina de Chito y Ynta," "quina blanca," "cascarilla colorada," "cascarilla de Santa Ana," "quina amarilla," "carua-carua," "cargua-cargua," "cascarilla mula," "cascarilla zamba morada," "cascarilla de Carabaya."

This species is almost as variable as *C. officinalis.* It is and has been one of the most important sources of the cinchona bark employed in medicine, if not the principal one.

Cinchona umbellulifera Pavón ex Howard, Ill. Nueva Quinol. Pav. *pl. 22.* 1862.—Described from Peru, the type collected by Pavón. I have seen no material of the species, whose status is uncertain.

7. JOOSIA Karst.

Trees with bitter bark; stipules caducous; leaves opposite, petiolate, herbaceous; inflorescence cymose or verticillate-umbellate, the flowers white, 5-parted; calyx large, 5-dentate, in bud open or subvalvate; corolla salverform, deeply lobed, each lobe provided with 2 petaloid, crispate appendages, the tube glabrous within; stamens inserted in the tube, the filaments short, the anthers linear; capsule linear, bisulcate, 2-celled; seeds numerous, imbricate, winged. —The genus consists only of the three species listed here.

Capsule valves 1.5–2.5 cm. long, not spirally twisted after dehiscence. *J. Dielsiana.*

Capsule valves 3.5–6.5 cm. long, spirally twisted after dehiscence.

Leaves glabrous on the upper surface; inflorescence cymose-umbellate; capsule appressed-pilose.....*J. umbellifera.*

Leaves appressed-pilose on the upper surface; inflorescence strictly dichotomous; capsule glabrous.....*J. dichotoma.*

Joosia dichotoma (R. & P.) Karst. Fl. Columb. 1: 9. 1858. *Cinchona dichotoma* R. & P. Fl. 2: 53. *pl. 197.* 1799. *Ladenbergia dichotoma* Klotzsch in Hayne, Arzneigew. 14: sub *pl. 15.* 1846. *Cosmibuena dichotoma* G. Don, Hist. Dichl. Pl. 3: 479. 1834.

A nearly glabrous shrub or tree 2–8 meters high; stipules oblong-obovate, obtuse, longer than the petioles, caducous; leaves short-

petiolate, oblong-lanceolate to elliptic, acute, at the base acute or obtuse, sericeous-pilose beneath; inflorescence rather few-flowered, the flowers secund, short-pedicellate; corolla about 17 mm. long, with a slender tube. Neg. 6641.

Huánuco: Type from Chicoplaya, *Tafalla* in 1797.—Loreto: Pampas de Ponasa, 1,200 meters, *Ule 6795*.

Joosia Dielsiana Standl. Field Mus. Bot. 11: 219. 1936.

A tree 6 meters high, the trunk 12 cm. in diameter; stipules narrowly oblong, 1 cm. long, obtuse; glabrate, deciduous; leaves 9–18 cm. long, petiolate, elliptic-oblong or narrowly elliptic, acutely acuminate, acute at the base, glabrous above, at first laxly appressed-pilose beneath, soon glabrate; inflorescence long-pedunculate, rather laxly few-flowered; corolla densely appressed-pilose, the slender tube greenish yellow, 11–12 mm. long, the lobes of equal length; capsule oblong, subterete, glabrate.

Loreto: Upper Marañón, mouth of Río Santiago, in upland forest, 160 meters, *Tessmann 4478*, type.

The fruit is so unlike that of the other species that the tree might be considered worthy of generic segregation, but the curious corolla is very similar to that of the other species, and quite unlike the corolla of any other genus of the family.

Joosia umbellifera Karst. Fl. Columb. 1: 9. *pl. 5*. 1858; Schum. in Mart. Fl. Bras. 6, pt. 6: 159. *pl. 100*. 1889.

A medium-sized tree; stipules linear-oblong, acute or subobtuse, 1.5 cm. long; leaves short-petiolate, oblong to obovate-oblong or oblong-lanceolate, 10–22 cm. long, long-acuminate, acute to rounded at the base, appressed-pilose beneath on the veins; inflorescence 15 cm. long; calyx lobes triangular-ovate, acute; corolla subsericeous, 12–14 mm. long, the lobes ovate, each bearing at the apex 2 large, oval appendages; capsule 3.5–6.5 cm. long, 3 mm. wide.

San Martín: Reported by Schumann from Tarapoto, *Spruce 3944*.—Loreto: Balsapuerto, 220 meters, *Klug 2943*. Also in Colombia.

The plant is described as a shrub of 2–3 meters or as a tree of 7–11 meters. The flowers are pure white and sweet-scented.

8. MACROCNEMUM L.

Shrubs or trees; stipules usually caducous; leaves opposite, petiolate; inflorescences axillary, often leafy, paniculate, the flowers

usually showy, 5-parted; calyx persistent, short or elongate, 5-dentate or lobate; corolla salverform or funnelform, the lobes valvate in bud, the tube pilose at the insertion of the stamens; stamens unequal, attached to the middle of the tube, exserted; capsule 2-celled, oblong or cylindric, bisulcate, loculicidal; seeds numerous, minute, compressed, narrowly winged.

Leaves glabrous beneath but barbellate in the axils of the nerves, sometimes minutely appressed-pilose when young, but soon glabrate ..... *M. roseum.*

Leaves more or less densely pilose beneath with short, spreading hairs.

Calyx lobes obtuse ..... *M. cinchonoides.*

Calyx lobes acute ..... *M. pilosinervium.*

Macrocnemum cinchonoides Wedd. Ann. Sci. Nat. IV. 1: 76. 1854. *Lasionema cinchonoides* Wedd. Hist. Quinquin. 99. 1849.

Leaves short-petiolate, the blades obovate or oblanceolate-oblong, acute, narrowed to the base, glabrous above, short-pilose beneath, the veins glabrate; calyx lobes short, obtuse; branches of the panicle densely rusty-pilose; capsule linear-clavate, arcuate, 1.5–2 cm. long. "Cascarilla bruta." Neg. 183.

Puno: Humid forests, Tambopata, Province of Carabaya, *Weddell 4349*, type material.

Probably both this and *M. pilosinervium* are only variants of *M. roseum*, and not worthy of specific rank.

Macrocnemum pilosinervium Standl. Field Mus. Bot. 4: 326. 1929.

Branchlets densely appressed-pilose; leaves short-petiolate, the blades obovate or oblong-obovate, 15–22 cm. long, acute, acute at the base or attenuate, glabrous above, densely spreading-pilose beneath and with dense, subappressed hairs along the veins; inflorescences long-pedunculate, densely many-flowered, the branches appressed-pilosulous; corolla glabrous, the tube 1 cm. long, the rounded lobes 2–2.5 mm. long; immature capsule 8 mm. long.

Type from Peru, without locality, *Mathews* in 1862.

Macrocnemum roseum (R. & P.) Wedd. Ann. Sci. Nat. IV. 1: 76. 1854. *Cinchona rosea* R. & P. Fl. 2: 54. *pl. 199.* 1799. *C. fusca* Ruiz ex Vitm. Summa Suppl. 1: 262. 1802. *Lasionema roseum* Don, Edinb. Phil. Mag. 2: 377. 1833. *C. Tarantaron* Pav. ex Wedd.

Hist. Quinquin. 64. 1840, in syn. *M. Sprucei* Rusby, Mem. Torrey Club 6: 44. 1896.

A shrub or tree, as much as 15 meters high and probably larger, nearly glabrous; leaves petiolate, the blades obovate to oblong, obtuse, cuneately narrowed to the base, firm, mostly 6–15 cm. long and 3–7 cm. wide; inflorescence rusty-pilosulous or sometimes glabrate; corolla pink, glabrous outside, about 12 mm. long; capsule 1.5–2 cm. long. Negs. 185, 564, 6643.

Amazonas: Mouth of Río Santiago, *Tessmann 3509*. Marañón Valley, *Tessmann 3835*.—Huánuco: Described from Posuso and San Antonio de Playa (type material seen). Posuso, 600 meters, *Macbride 4588*. Pampayacu, *Sawada 15*. Río Posuso, *Weberbauer 6751*.—Loreto: Lower Río Huallaga, 200 meters, *Williams 4957*. Cahipuerto, 250 meters, *Klug 3123*. Puerto Arturo, 135 meters, dense forest, *Killip & Smith 27898*. Pumayacu, 600–1,200 meters, *Klug 3202*.—Madre de Dios(?): Seringal San Francisco, Río Acre, *Ule 9862*.—San Martín: Tarapoto, *Williams 5468; Spruce 3972*. Campana, near Tarapoto, *Spruce 4367*. Pongo de Cainarachi, 230 meters, *Klug 2631*. Juan Jui, Alto Río Huallaga, 400 meters, *Klug 3788*.—Without locality, Pavón. Also in Bolivia and Brazil.

"Palo de San Juan," "asmonich," "cascarillo pardo." Ruiz and Pavón state that the flowers were used for decoration in the churches.

9. REMIJIA DC.

Shrubs or trees; stipules binate or quaternate; leaves opposite or verticillate, petiolate, usually coriaceous; inflorescence axillary, paniculate, with opposite branches, 5-parted; calyx dentate or lobate; corolla salverform, the tube glabrous within, the lobes mostly coriaceous, glabrous on the margins, valvate in bud; stamens inserted on the tube, included or subexserted, the anthers linear; capsule 2-celled, loculicidal, the valves woody, bifid; seeds peltately attached, winged.

Capsules 8–10 mm. long; leaf blades attenuate to the narrow base; hypanthium glabrous or nearly so..... *R. megistocaula.*

Capsules 12–15 mm. long; leaf blades merely acute at the base or often obtuse; hypanthium densely appressed-pilose. *R. peruviana.*

Remijia megistocaula Krause, Bot. Jahrb. 40: 319. 1908.

A tree up to 30 meters high, the branchlets puberulent; stipules 3–3.5 cm. long, ovate, acuminate, glabrate, soon deciduous; leaves

short-petiolate or almost sessile, the blades coriaceous, lanceolate to obovate-lanceolate, 25–40 cm. long, 12–16 cm. wide, or sometimes smaller, glabrate, short-acuminate; inflorescences large and many-flowered, ferruginous-pilose; capsule narrowly pyriform, glabrous. Negs. 161, 162.

Huánuco: Between Monzón and Río Huallaga, 700 meters, *Weberbauer 3687*, type collection.

Remijia peruviana Standl. Field Mus. Bot. 8: 156. 1930.

A shrub or tree as much as 10 meters high; stipules deciduous, oval or oblong, obtuse or rounded at the apex; leaves opposite, short-petiolate, the blades coriaceous, elliptic or broadly ovate, 8–17 cm. long, 4–9 cm. wide, acute, beneath minutely appressed-pilosulous, especially on the veins, or glabrate; panicles long-pedunculate, many-flowered, about equaling the leaves, densely fulvous-pilosulous; calyx lobes ovate or lanceolate, acute; corolla white, densely fulvous-sericeous, the tube 8–11 mm. long, the attenuate lobes 5–6 mm. long; capsule narrowly oblong, sparsely appressed-pilosulous. "Cascarilla," "asar lisa," "collar lisa." "Quina" (Colombia).

Loreto: Balsapuerto, 220 meters, *Klug 3072*. Near Marana, vicinity of Iquitos, *Williams 1512* (type), *1511*. Forest between Nanay and Napo rivers, *Williams 675*. Punchana, *Williams 1333, 8022*. San Juan, in forest, *Williams 3738*. Morona-cocha, 115 meters, *Mexia 6512a*. Palta-cocha, Alto Nanay, *Williams 3190*. Nauta, Río Ucayali, *Spruce 3857*. Mishuyacu, 100 meters, *Klug 1340, 1203*. Iquitos, *Tessmann 3661, 5095; Killip & Smith 26973, 27296*. Río Nanay, *Williams 340*.—San Martín: Tarapoto, *Spruce 4581, 4263; Williams 6107, 6670, 6322*. Also in Colombia.

10. PIMENTELIA Wedd.

Trees; stipules free, covered at the base with resin; leaves opposite, short-petiolate, subcoriaceous; inflorescence axillary, paniculate, small, the flowers sessile; hypanthium turbinate, puberulent; calyx short, persistent, the teeth triangular; capsule linear-oblong, short, 2-celled, septicidally dehiscent from apex to base, the valves entire; seeds numerous, minute, linear-lanceolate, winged.

The genus was named for Don Pablo Pimentel, once governor of the Province of Carabaya. It consists of a single species.

Pimentelia glomerata Wedd. Monogr. Cinchon. 94. *pl. 27, B.* 1849.

A tree 5–6 meters high, the trunk 20–30 cm. in diameter, the branchlets glabrous, resinous; stipules ovate, obtuse, glabrous; leaf blades oblong-obovate, 20–25 cm. long, 10–13 cm. wide, rounded to short-acuminate, acute at the base, pilosulous beneath in the axils of the nerves, otherwise glabrous; panicles opposite, rounded, many-flowered, the short branches glabrate; capsule 1 cm. long, 3 mm. wide, glabrate. Neg. 160.

Puno: Type collected in the mountains of Carabaya, growing with various species of *Cinchona* and *Ladenbergia, Weddell;* photo. seen of specimen in hb. Berol. "Ueno-ueno," "beno-beno."

11. LADENBERGIA Klotzsch

Shrubs or small trees, pubescent or almost glabrous; stipules free or united, caducous; leaves opposite, petiolate, small or large, often coriaceous; flowers large or medium-sized, disposed in terminal panicles, these leafless and with opposite branches; calyx commonly 5-dentate or 5-lobate; corolla salverform, pilose, the lobes valvate, short-papillose on the margins or over the inner surface; stamens included, the anthers linear; capsule usually cylindric, dehiscent from the apex, woody or coriaceous; seeds broadly winged.

The species of this genus, closely related to *Cinchona*, are almost as difficult of discrimination as in the latter. Since they are of little economic importance, less attention has been given to them by botanists and pharmacists, and their synonymy is, therefore, far less involved.

Corolla 7–10 mm. long; capsule 1–2 cm. long. Leaves acuminate, pilose beneath in the axils of the nerves, otherwise glabrous or nearly so..... *L. pedunculata.*

Corolla 1.8–5.5 cm. long; capsules usually larger.

Leaves conspicuously bullate, oblanceolate-oblong, short-hispid beneath on the veins. Capsules about 4.5 cm. long. *L. bullata.*

Leaves not bullate, not short-hispid beneath, usually broadest at or below the middle.

Calyx 7 mm. wide or more in anthesis; corolla tube very thick and broad; stipules connate into a cap. Leaf blades acute at the base, densely pubescent beneath..... *L. crassifolia.*

Calyx much narrower; corolla tube slender; stipules free or nearly so.

Leaves densely pubescent or tomentose beneath, the pubescence persistent.

Leaf blades acute at the base, oblong or obovate-oblong. *L. Riveroana.*

Leaf blades rounded or subcordate at the base, broadly oval to elliptic or rounded.

Lobes of the corolla almost equaling the tube, the corolla less than 2 cm. long..... *L. gavanensis.*

Lobes of the corolla much shorter than the tube, the corolla more than 3 cm. long.

Corolla 3.5 cm. long..... *L. malacophylla.*

Corolla 4.5–5 cm. long..... *L. Carua.*

Leaves glabrous or glabrate beneath except sometimes on the veins, the pubescence, if any, chiefly deciduous.

Calyx repand-dentate or shallowly lobate, the lobes shorter than the tube.

Leaves glabrous, paler beneath, 2–4.5 cm. wide. *L. discolor.*

Leaves pubescent beneath on the veins, broader. *L. ferruginea.*

Calyx deeply lobate, usually to below the middle.

Calyx lobes rounded-ovate, obtuse.... *L. heterophylla.*

Calyx lobes ovate or lanceolate, acuminate to acutish.

Hypanthium glabrous. Leaf blades 5–6.5 cm. long, rounded-obovate, glabrous..... *L. coriacea.*

Hypanthium densely pilose or sericeous.

Corolla 2 cm. long or less.

Leaf blades oblong-lanceolate, acute at the base. *L. stenocarpa.*

Leaf blades chiefly elliptic or ovate and obtuse to rounded at the base..... *L. magnifolia.*

Corolla 3–3.5 cm. long.

Leaf blades rounded at the base; pubescence of the hypanthium spreading.... *L. acutifolia.*

Leaf blades acute or obtuse at the base; pubescence of the hypanthium appressed.. *L. graciliflora.*

Ladenbergia acutifolia (R. & P.) Klotzsch in Hayne, Arzneigew. 14: sub *pl. 15.* 1846. *Cinchona acutifolia* R. & P. Fl. 3: 1. *pl. 225.* 1802. *Cascarilla acutifolia* Wedd. Ann. Sci. Nat. III. 10: 11. 1848. *Buena acutifolia* Wedd. Journ. Linn. Soc. 11: 186. 1869.

A shrub or tree 3–7 meters high, the branches glabrate; stipules ovate, acute; leaves petiolate, the blades ovate-lanceolate to lance-oblong, sometimes 20 cm. long, acute or acuminate, rounded at the base, coriaceous, glabrous and shining above, pilosulous beneath on the veins; inflorescence long-pedunculate, small, many-flowered, the branches tomentulose, the flowers subsessile; calyx lobes lanceolate; corolla white, 3 cm. long, the lobes shorter than the tube; capsule oblanceolate, about 3 cm. long, pubescent. Negs. 136, 6642.

Huánuco: Type from Chicoplaya, *Ruiz & Pavón;* authentic specimen seen in hb. Deless., and photos. ex hb. Berol. "Cascarilla."

Ladenbergia bullata (Wedd.) Standl. Trop. Woods 34: 41. 1933. *Cascarilla bullata* Wedd. Ann. Sci. Nat. III. 10: 11. 1848. *Buena bullata* Wedd. Journ. Linn. Soc. 11: 187. 1869.

A shrub or tree 3–5 meters high, the branchlets glabrate; stipules oblong; leaves short-petiolate, the blades oblanceolate-oblong, 15–20 cm. long, 4–8 cm. wide, acute or acutish at each end, conspicuously bullate, almost glabrous, coriaceous, shining above; panicle few-flowered, corymbose, the branches ferruginous-pilose; calyx lobes lanceolate; capsule oblong, 4–8 cm. long, 6–10 mm. wide, glabrate. Negs. 127, 25714.

Puno: Described from the valleys of Tambopata and San Juan del Oro, at 2,000–2,500 meters, *Weddell;* authentic material seen in hb. Deless. Between Yuncacoya and Ramospata, *Raimondi 10068.* "Cargua-cargua," "cargua-cargua chica."

Ladenbergia Carua (Wedd.) Standl. Field Mus. Bot. 7: 274. 1931. *Cascarilla Carua* Wedd. Ann. Sci. Nat. III. 10: 12. 1848. *Cinchona Carua* Miq. Ann. Mus. Bot. Lugd. Bat. 4: 275. 1868–69. *Buena Carua* Wedd. Journ. Linn. Soc. 11: 187. 1869.

A tree, the branchlets ferruginous-tomentose; stipules large, obtuse or rounded, tomentose; leaves short-petiolate, the blades oblong or oval, very large, 30–40 cm. long and more, obtuse or acute, cordate or rounded at the base, pubescent or glabrate above, ferruginous-tomentose beneath; panicles large, rather few-flowered, the white flowers very fragrant; calyx teeth short, triangular; corolla densely sericeous, 4.5–5 cm. long, the lobes more than half as long as the tube; capsule 3.5–5 cm. long, tomentose.

Reported by Weddell from the departments of Cuzco and Puno (Province of Carabaya). Also in Bolivia. "Cargua-cargua," "cargua-cargua grande." "Carua," "cascarilla de mula" (Bolivia).

Ladenbergia coriacea Krause, Bot. Jahrb. 40: 318. 1908.

A shrub or small tree 4 meters high; stipules triangular, acute, 4–6 mm. long; leaves short-petiolate, stiff-coriaceous, the blades rounded-obovate or broadly elliptic, 5–6 cm. long, 3–3.5 cm. wide, obtuse to rounded and apiculate at the apex, acutish to rounded at the base, glabrous; panicles many-flowered, rather dense; hypanthium glabrous, the triangular calyx lobes acute; corolla puberulent, the tube 15–18 mm. long, the lobes oblong, 8–10 mm. long; capsule rather broadly oblong, 15–18 mm. long, glabrous. Neg. 128.

Amazonas: Molinopampa east of Chachapoyas, 2,000–2,300 meters, *Weberbauer 4331*, type; photo. and fragm. seen, ex hb. Berol. Chachapoyas, *Mathews*.

Ladenbergia crassifolia (Pavón) Standl. Field Mus. Bot. 7: 200. 1931. *Cinchona crassifolia* Pavón ex DC. Bibl. Univ. 41: 150. 1829; Prodr. 4: 354. 1830. *Cascarilla calyptrata* Wedd. Ann. Sci. Nat. III. 10: 13. 1848. *Buena crassifolia* Wedd. Journ. Linn. Soc. 11: 187. 1869.

A tree, the branchlets densely ferruginous-tomentose; stipules connate into a cap that encloses the buds; leaves petiolate, the blades coriaceous, oblong to narrowly elliptic, mostly 15–20 cm. long, acutish, attenuate to the base, glabrous and lustrous above, densely puberulent beneath; panicles corymbiform, few-flowered, the branches ferruginous-tomentose; calyx short, the broadly triangular lobes acute or obtuse; corolla tube thick, densely sericeous, 2.5 cm. long, the narrow lobes slightly shorter; capsules 4–7 cm. long, 1 cm. broad, becoming glabrate. Neg. 25716.

Junín: Chanchamayo Valley, 1,500 meters, *Schunke 297*.— Without locality, *Pavón*. Also in southern Ecuador, where it was first collected by Ruiz and Pavón in the region of Loja.

The Peruvian plant has been confused with the closely related *L. macrocarpa* (Vahl) Klotzsch, and the latter has been reported from Peru, apparently in error, the collections so reported being really from southern Ecuador.

Ladenbergia discolor Schum. in Mart. Fl. Bras. 6, pt. 6: 146. 1889.

A shrub 1–4 meters high, the branchlets at first ferruginous-tomentulose, soon glabrate; leaves short-petiolate, coriaceous, the blades oblong or ovate-oblong, 7–10 cm. long, 2–4.5 cm. wide, acute or subobtuse at each end, lustrous, glabrous, paler beneath; inflores-

cence dense, 4–5 cm. long, the branches pilosulous, the flowers subsessile; calyx repand-dentate or undulate; corolla white, sericeous, 18 mm. long, the lobes half as long as the tube, linear, acute. Neg. 140.

Loreto: Canela Ucsha, 1,000 meters, *Ule 6767*.—San Martín: Near Tarapoto, *Spruce 4247*, type collection. Between Tarapoto and Chasuta, *Raimondi 1195*.

Ladenbergia ferruginea Standl. Field Mus. Bot. 8: 336. 1931.

A shrub 4 meters high, the branchlets densely ferruginous-hispidulous; leaves slender-petiolate, subcoriaceous, the blades oblong-elliptic or lance-oblong, 14–25 cm. long, 5.5–9 cm. wide, acute or short-acuminate, narrowed to the acute base, ferruginous-pilose beneath on the veins; panicles dense and many-flowered, the branches ferruginous-tomentose, the flowers pedicellate; calyx 3.5 mm. long, sparsely pilose, the teeth triangular, acute or apiculate; corolla white, appressed-pilose, the tube 10–12 mm. long, the lobes 6–7 mm. long.

Puno: Chunchusmayo, in forest near the river, 900 meters, *Weberbauer 1175*, type.

Ladenbergia gavanensis (Schlecht.) Standl., comb. nov. *Cascarilla gavanensis* Schlecht. Linnaea 26: 730. 1854.

Leaves petiolate, subcoriaceous, the blades rounded-oval, 25 cm. long or more, obtuse or rounded at each end or sometimes acutish, densely ferruginous-tomentose beneath; panicles rather open, many-flowered, the branches puberulent; hypanthium densely pubescent, the calyx teeth broadly triangular, acute; corolla densely tomentose, the tube 8 mm. long, the narrow lobes 7 mm. long. Neg. 126.

Puno: Mountains near Sangabán, *Lechler*, type; photo. seen ex hb. Berol.

The species was based upon scant material and its status is uncertain.

Ladenbergia graciliflora Schum. in Mart. Fl. Bras. 6, pt. 6: 145. 1889.

A small tree, the branchlets rufous-tomentulose; stipules lance-oblong, more than 2 cm. long, attenuate; leaves slender-petiolate, subcoriaceous, the blades oblong or ovate, 11–13 cm. long, 5–6.5 cm. wide, acute or acuminate, obtuse or rounded at the base, lustrous, at first puberulent but soon glabrate; panicles 6–8 cm. long, dense,

many-flowered, the branches puberulent, the flowers short-pedicellate; calyx lobes triangular-lanceolate, glabrous or nearly so; corolla white, 3–3.5 cm. long, tomentulose, the narrow lobes less than half as long as the tube; capsule linear, glabrous, 4–5 cm. long. Negs. 154, 141.

San Martín: Near Tarapoto, *Spruce 4581*, type collection. Also in Goyaz, Brazil.

Ladenbergia heterophylla (Wedd.) Standl. Field Mus. Bot. 7: 18. 1930. *Cascarilla heterophylla* Wedd. Ann. Sci. Nat. III. 10: 10. 1848. *Buena heterophylla* Wedd. Journ. Linn. Soc. 11: 186. 1869.

Branchlets pubescent; stipules ovate or ovate-oblong, obtuse; leaves short-petiolate, submembranaceous, the blades rounded-ovate, 10–30 cm. long, obtuse or acutish, glabrate above, pilosulous beneath in the axils of the nerves; panicle corymbose, the branches tomentulose; calyx lobes rounded-ovate, obtuse; corolla twice as long as the calyx, tomentulose; capsule 10–15 cm. long, 12–15 mm. wide.

Reported by Weddell from Peru, without indication of the locality; also in Colombia.

I have seen no material representative of this species.

Ladenbergia magnifolia (R. & P.) Klotzsch in Hayne, Arzneigew. 14: sub. *pl. 15*. 1846. *Cinchona magnifolia* R. & P. Fl. 2: 53. *pl. 196*. 1799. *Cinchona grandifolia* Poir. Encycl. 6: 38. 1804. *Cinchona caduciflora* H. & B. Pl. Aequin. 168. 1813. *Cascarilla magnifolia, C. caduciflora, C. rostrata* Wedd. Ann. Sci. Nat. III. 10: 10. 1848. *Cascarilla magnifolia* var. *vulgaris*, var. *caduciflora*, var. *rostrata* Wedd. Hist. Nat. Quinq. 79. 1849. *Cinchona lutescens* Ruiz ex Vitm. Summa, Suppl. 1: 262. 1802.

A small or medium-sized tree with cinnamon-brown bark; stipules 2–3 cm. long, acute, sericeous; leaves long-petiolate, coriaceous, the blades elliptic to oblong-ovate, 10–30 cm. long, 7–20 cm. wide, acute or obtuse, acute to rounded at the base, glabrous above and often shining, beneath pubescent or usually almost glabrate but barbellate in the axils of the nerves; panicles usually large and open, many-flowered; calyx lobes triangular-ovate, acute, tomentulose; corolla white or pink, sericeous, 1.5 cm. long, the lobes about equaling the tube; capsule linear-oblong or lanceolate, 2.5–7 cm. long, 7–10 mm. broad, glabrate. Negs. 156–158, 575.

Huánuco: Described from Chinchao, Cochero, and Chacahuasi, *Ruiz & Pavón;* authentic material seen, ex hb. Berol. Posuso, 600

meters, *4705*.—Cajamarca: Jaén, *Humboldt & Bonpland*, type material of *C. caduciflora;* seen in hb. Deless.—Junín: La Merced, 1,200 meters, *5759, 5725*. Chanchamayo Valley, 1,500 meters, *Schunke 270*.—Loreto: Balsapuerto, 220 meters, *Klug 3035*. Pumayacu, *Klug 3142*. Iquitos, in forest, *Williams 3781*. Mishuyacu, *Klug 1345, 1387; Killip & Smith 29952*.—San Martín: Tarapoto, Mt. Campana, *Spruce 4843*. Bolivia to Colombia. "Cascarilla boba," "cascarilla amarilla," "cascarilla flor de azahar."

The tree once was believed to furnish quinine, but it was found later that its bark possessed no value as a drug. The tree is said to be highly ornamental when covered with its handsome white flowers, which exhale an odor suggestive of orange or jasmine blossoms.

Ladenbergia malacophylla Standl. Field Mus. Bot. 8: 157. 1930.

A tree 6–12 meters high, the branchlets densely tomentose; leaves petiolate, firm-membranaceous, the blades broadly oval or elliptic, 22–26 cm. long, 14–18 cm. wide, obtuse or almost rounded at the apex, broadly rounded or shallowly cordate at the base, pilosulous above, velutinous-pilose beneath; panicles rather large and many-flowered, the branches fulvous-tomentose, the flowers sessile or short-pedicellate; hypanthium densely pilose, the calyx 2–2.5 mm. long, the lobes ovate or triangular, acute or subobtuse; corolla white, densely sericeous, the slender tube 22–24 mm. long, the lobes half as long; capsule oblong, 2.5–4.5 cm. long, sparsely puberulent or pilosulous.

Junín: Porvenir, Pichis Trail, in dense forest, 1,500–1,900 meters, *Killip & Smith 25914*, type; *25434*. Ecuador.

Ladenbergia pedunculata (Karst.) Schum. in Mart. Fl. Bras. 6, pt. 6: 146. 1889. *Cinchona pedunculata* Karst. in Koch & Fint. Wochenschr. 2: 30. 1859; Karst. Fl. Columb. 1: 53. *pl. 36*. 1859. *Remijia pedunculata* Flueck. Chinarinde 17. *pl. 6*. 1883.

A small tree 3–4.5 meters high, the young branches sericeous; stipules obovate, sericeous-pilose; leaves petiolate, coriaceous, the blades lanceolate to elliptic or ovate, 6–17 cm. long, 3–8 cm. wide, acuminate, at the base attenuate to subcordate, when young minutely appressed-pilose, pilose beneath in the axils of the nerves; inflorescences terminal and axillary, long-pedunculate, the branches pilosulous, the flowers subsessile; calyx lobes ovate or subulate, glabrous, sometimes ciliate; corolla white, 7–10 mm. long, appressed-pilose,

the lobes equaling the tube; capsules 1–2 cm. long, 6 mm. broad, glabrous.

San Martín: Tarapoto, *Spruce 4263*. Also in Colombia.

Ladenbergia Riveroana (Wedd.) Standl. Field Mus. Bot. 7: 201. 1931. *Cinchona oblongifolia* Lamb. Ill. Cinch. 12. 1821, non Mutis, 1793. *Cascarilla Riveroana* Wedd. Ann. Sci. Nat. III. 10: 11. 1848.

A tree, the branchlets ferruginous-tomentose or finally glabrate; stipules ovate-oblong, tomentose; leaves thin-coriaceous, short-petiolate, the blades oblong-lanceolate or ovate-oblong, 15–25 cm. long, 9–15 cm. wide, acute at each end or more rarely obtuse, puberulent or glabrate above, tomentose or puberulent beneath, with rusty pubescence; panicles rather large and many-flowered, ferruginous-tomentose; hypanthium tomentose, the calyx teeth ovate, acutish, tomentulose; corolla pilose, the tube 7–15 mm. long, the lobes 6–8 mm. long; capsule linear-lanceolate, 4–6 cm. long, ferruginous-tomentose. Neg. 113.

Junín: Huacapistana, 1,800–2,400 meters, *Killip & Smith 24214*, a shrub or tree 3–3.5 meters high.—San Martín: Zepelacio, 1,200–1,600 meters, *Klug 3515*. Bolivia to Ecuador. "Azahar macho," "azahar hembra."

Klug describes the species as a tree of 5 meters with white flowers.

Ladenbergia stenocarpa (Lamb.) Klotzsch in Hayne, Arzneigew. 14: sub *pl. 15*. 1846. *Cinchona stenocarpa* Lamb. Ill. Cinch. 13. 1821. *Cascarilla stenocarpa* Wedd. Hist. Nat. Quinq. 81. 1849. *Buena stenocarpa* Wedd. Journ. Linn. Soc. 11: 186. 1869.

Branchlets glabrate; stipules ovate; leaves short-petiolate, submembranaceous, the blades oblong-lanceolate, acute at each end, 12–15 cm. long, glabrous or pilose beneath along the costa; panicle open, many-flowered, the branches puberulent; hypanthium tomentulose, the calyx teeth ovate, acutish; corolla puberulent, the tube 13–15 mm. long, the lobes 9–10 mm. long; capsule linear, 3.5 cm. long. Neg. 135.

Cajamarca: Type from Jaén, *Pavón;* photo. of authentic material seen, ex hb. Berol. "Cascarilla azaharito."

12. CAPIRONA Spruce

Trees with large stipules; leaves large, opposite, petiolate; inflorescence terminal, paniculate, the flowers showy, 5-parted, zygomorphic; calyx cupular, 5-dentate, one of the teeth often

expanded into a large, foliaceous, colored limb; corolla somewhat gibbous from a tubular base, the limb campanulate and subbilabiate, the short lobes contorted in bud; stamens inserted above the base of the tube, the filaments villous at the base, the anthers linear; capsule clavate or obovate, 2-celled, septicidally bivalvate; seeds numerous, winged.

Capirona decorticans Spruce, Journ. Linn. Soc. 3: 200. 1859; Schum. in Mart. Fl. Bras. 6, pt. 6: 195. *pl. 107.* 1888.

A tree 13–16 meters high with reddish brown bark; stipules more or less foliaceous, acute or acuminate, 3–6 cm. long; leaves almost sessile, oblong to oval, 22–45 cm. long, obtuse or short-acuminate, very obtuse to subcordate at the base, almost glabrous; panicles 15–20 cm. long or more; calyx 3–4 mm. long, the expanded lobe obovate-spatulate, 5–7 cm. long, red, attenuate at the base; corolla 2.5–3 cm. long, the lobes ovate, obtuse; capsule 2–3 cm. long, woody. "Capirona negra."

San Martín: Near Tarapoto, *Spruce 4202*, type collection. Tarapoto, in forest, *Williams 6070*. Also in Colombia.

13. HILLIA Jacq.

Shrubs, usually epiphytic, glabrous, with thick branches; stipules membranaceous, caducous; leaves opposite, fleshy, drying thick and hard; flowers large and showy, solitary or clustered, surrounded by an involucre of leaves or bracts, 4–6-parted; calyx none or composed of 2–6 free or short-connate segments, persistent or caducous; corolla salverform or funnelform-tubular, the lobes contorted, the throat glabrous; stamens inserted below the throat of the corolla, included, the anthers oblong; fruit a cylindric capsule, somewhat attenuate at each end, septicidally bivalvate; seeds fusiform, bearing a tuft of hairs at one end.

Leaves small, mostly 7–8 mm. wide..... *H. Macbridei.*

Leaves comparatively large, commonly 2–8 cm. wide.

Corolla tube conspicuously dilated in the throat and 1.5–2.5 cm. wide; calyx lobes persistent.

Leaf blades rounded or very obtuse at the base, mostly 2–3.5 cm. wide; corolla about 4 cm. long..... *H. Ulei.*

Leaf blades acute at the base, 4–7 cm. wide; corolla about 5.5 cm. long..... *H. illustris.*

Corolla tube slender, scarcely dilated in the throat and less than 1 cm. wide; calyx lobes deciduous.

Veins of the leaves conspicuous; lobes of the corolla about half as long as the tube..... *H. Killipii.*

Veins of the leaves obscure or obsolete; lobes of the corolla less than one-third as long as the tube.

Leaf blades elliptic or oblong-elliptic, rounded to acute at the base..... *H. parasitica.*

Leaf blades narrowly oblanceolate-oblong, attenuate to the base..... *H. Weberbaueri.*

Hillia illustris (Vell.) Schum. in Mart. Fl. Bras. 6, pt. 6: 202. 1889. *Saldanha illustris* Vell. Fl. Flum. 3: *pl. 157.* 1827; text, ed. Netto 134.

Leaves short-petiolate, thick and hard when dried, the blades elliptic or broadly elliptic-ovate, 10–16 cm. long, abruptly acuminate; flowers solitary, subtended by 2 large stipules, these 1.5–2 cm. long, obtuse; calyx lobes 6, linear-subulate, herbaceous, 1.5–2 cm. long; corolla white, the short lobes ovate-rounded, recurved; capsule 10 cm. long and 1 cm. thick. Neg. 234.

Loreto: Río Itaya, in forest, *Williams 99.* Extending to Brazil and the Guianas.

Hillia Killipii Standl. Field Mus. Bot. 8: 159. 1930.

Described as a tree 3–4.5 meters high; stipules narrowly oblong, rounded at the apex, 2.5 cm. long; petioles slender, 1–1.5 cm. long; leaf blades comparatively thin, elliptic-oblong, 7.5–9.5 cm. long, 3–3.5 cm. wide, abruptly long-acuminate, acute at the base; flowers terminal, solitary, sessile, subtended by 2 stipules; calyx obsolete; corolla white, the slender tube 8 cm. long, the 6 lobes lance-linear, 4–4.5 cm. long.

Junín: Between San Nicolás and Azupizú, in dense forest, 650–900 meters, *Killip & Smith 26085,* type.—Loreto: Pumayacu, 100–600 meters, a liana on a tree, *Klug 3145.*

Hillia Macbridei Standl. Field Mus. Bot. 4: 277. 1929.

A small epiphytic shrub; stipules lanceolate or linear-lanceolate, caducous, 1.5–2 cm. long; petioles 3–5 mm. long; leaf blades lanceolate, 2–3 cm. long, narrowed to the subobtuse apex, acute at base, the veins obsolete; flowers terminal, solitary, sessile; calyx persistent, the 5 lobes oblong-ovate, obtuse, 5 mm. long; capsule narrowly clavate, 5.5–6.5 cm. long, 1 cm. wide.

Junín: La Merced, 1,200 meters, *Macbride 5760*, type. Chanchamayo Valley, 1,500 meters, *Schunke 436*. Above San Ramón, 1,300–1,700 meters, *Schunke A100*.

Hillia parasitica Jacq. Enum. Pl. Carib. 18. 1760. *Cosmibuena acuminata* R. & P. Fl. 3: 4. *pl. 226*. 1802. *Buena acuminata* DC. Prodr. 4: 356. 1830. *H. odorata* Krause, Bot. Jahrb. 40: 321. 1908.

A glabrous, epiphytic shrub, sometimes as much as 2 meters high, with stout branches; stipules 8–12 mm. long or more, obtuse; petioles thick, 2–7 mm. long; leaf blades mostly 5–11 cm. long, short-acuminate; flowers solitary, sessile; calyx lobes linear-lanceolate, obtuse, 4 mm. long; corolla white, the tube 6.5–12 cm. long, the 6 lobes linear-lanceolate to oblong; capsule cylindric, 7–9 cm. long. Negs. 235, 236 (*H. odorata*).

Amazonas: East of Chachapoyas, *Weberbauer 4364*.—Huánuco: Type of *Cosmibuena acuminata* from Chicoplaya, *Ruiz & Pavón*.—Junín: Chanchamayo Valley, *Schunke 290*. Huacapistana, 1,800 meters, *Weberbauer 2152*, type of *H. odorata* (photo. and fragm. seen, ex hb. Berol.). Ranging to Brazil, Mexico, and the West Indies.

Hillia Ulei Krause, Verh. Bot. Ver. Brandenb. 50: 97. 1908.

A glabrous epiphyte with stout branches; leaves short-petiolate, the blades broadly ovate or elliptic, 4–6.5 cm. long, obtusely short-acuminate or acute, rather conspicuously palmate-nerved, very thick; flowers terminal, solitary, pedicellate; calyx lobes 6, linear, 10–12 mm. long; corolla grass-green, the tube gradually narrowed from throat to base, the lobes short and broad; capsule 8–10 cm. long. Neg. 237.

Loreto: Near Yurimaguas, *Ule 6303*, type (photo. and fragm. seen ex hb. Berol.). Mishuyacu, near Iquitos, 100 meters, *Klug 1182*.

Hillia Weberbaueri Standl. Field Mus. Bot. 11: 214. 1936.

A glabrous epiphyte with stout branches; stipules oblong, obtuse, 18 mm. long; leaves short-petiolate, the blades narrowly oblanceolate-oblong, 8.5–13.5 cm. long, 2.5–3.5 cm. wide, abruptly rather long-acuminate, long-attenuate to the base, with about 8 pairs of lateral nerves; flowers terminal, solitary; calyx none or caducous; corolla 6-parted, the very slender tube 7 cm. long, the lobes oblong, obtuse, 1.5 cm. long.

Without locality: *Weberbauer 6955*, type.

14. COSMIBUENA R. & P.

Glabrous shrubs, usually epiphytic, often scandent; stipules caducous; leaves opposite, thick and fleshy; flowers large and showy, pedicellate, solitary or clustered, 5–6-parted; calyx 5–6-lobate, circumscissile at the base; corolla salverform, the lobes contorted, fleshy, the tube rather slender and much elongate; stamens inserted below the throat of the corolla, the anthers linear; capsule oblong or cylindric, 2-celled; seeds numerous, oblong or lanceolate, winged, the wings fimbriate or erose at the apex.

Cosmibuena grandiflora (R. & P.) Rusby, Bull. N. Y. Bot. Gard. 4: 368. 1907. *Cinchona grandiflora* R. & P. Fl. 2: 54. *pl. 198.* 1799. *C. obtusifolia* R. & P. Fl. 3: 3. *pl. 198.* 1802. *Buena obtusifolia* DC. Prodr. 4: 356. 1830.

A small or large, epiphytic shrub; leaves on stout petioles, the blades elliptic to obovate, 8–13 cm. long or larger, rounded at the apex, acute at the base, very thick, the nerves inconspicuous; calyx 10–12 mm. long, tubular below, soon deciduous; disk large and conspicuous; corolla white, the tube 6–9 cm. long, the lobes oblong, obtuse, about 2.5 cm. long; capsule 4–5 cm. long. Neg. 240.

Huánuco: Type from Posuso, *Ruiz & Pavón.* Monzón, 900 meters, *Weberbauer 3502.*—Junín: Reported by Ruiz and Pavón from Pueblo Nuevo de San Antonio de Chicoplaya.—Loreto: Moyobamba, 800 meters, *Weberbauer 4713.*—San Martín: Near Tarapoto, *Spruce 4179.*—Department uncertain: Without locality, *Pavón; Maclean.* Ranging from Colombia to Bolivia.

15. CALYCOPHYLLUM DC.

Trees with opposite leaves; stipules caducous; flowers small, 4–8-parted, arranged in terminal cymes, the bracts and bractlets large and membranaceous and enclosing the buds; calyx almost obsolete or of short segments, one of the segments in some of the flowers often expanded into a large, colored limb; corolla short-funnelform, lobed to the middle or more deeply, the segments imbricate in bud, the throat villous; stamens inserted in the throat, long-exserted; capsule costate, elongate, 2-celled, septicidally bivalvate; seeds small, winged.

Calycophyllum Spruceanum (Benth.) Hook. f. ex Schum. in Mart. Fl. Bras. 6, pt. 6: 191. *pl. 106.* 1889. *Eukylista Spruceana* Benth. Kew Gard. Misc. 5: 230. 1853.

A tree 15–27 meters high, with brown bark; leaves petiolate, the blades oblong to oblong-ovate, acute or obtuse, acute to obtuse at the base, 9–17 cm. long, minutely puberulent beneath at first but soon glabrate, barbate in the axils of the nerves; cymes dense and many-flowered, the inflorescences at first wholly enclosed by the thin bracts; calyx 6–9-dentate, the lobes all minute; corolla white, 6–7 mm. long, the lobes spreading; hypanthium densely white-pilosulous; capsule oblong, 8–11 mm. long, densely appressed-pilose. Neg. 8601.

Loreto: La Victoria on the Amazon, in forest, *Williams 3010, 2855*. Lower Río Nanay, *Williams 455*. Iquitos, *Williams 8033*. Yurimaguas, *Williams 4486*. Río Huallaga, *Spruce*. Río Ucayali, *Tessmann 3378*. Balsapuerto, 220 meters, *Klug 3005*. Rancho Indiana, 110 meters, *Mexia 6458*. Florida, Río Putumayo, riverside forest, 180 meters, *Klug 2190*. Fortaleza, 140 meters, *Klug 2814*. Also in eastern Bolivia and Amazonian Brazil.

"Capirona." Huber reports the tree as common along the lower Ucayali, where it forms forests known as capironales. The Brazilian name is "pao mulato." The wood is said to be strong, yellowish blackish, and useful for making various utensils and for construction purposes. It also is used extensively as firewood. Mrs. Mexia states that the bark is glossy and dark red, and that the flowers are slightly fragrant.

16. **LORETOA** Standl.

Large, glabrous trees; stipules large, persistent; leaves opposite, petiolate, coriaceous; flowers large, 5-parted, sessile or pedicellate, arranged in a large, terminal, sessile panicle composed of numerous open cymes; calyx cupular, shallowly 5–6-dentate, densely sericeous within; corolla clavate-funnelform, the short lobes contorted; anthers basifixed, on slender filaments inserted above the base of the tube; ovary 2-celled, the ovules peltately imbricate, winged.—The genus consists of a single known species.

Loretoa peruviana Standl. Field Mus. Bot. 11: 222. 1936.

A tree 20 meters high; stipules 3.5 cm. long, very obtuse or acutish; leaf blades broadly elliptic or suborbicular, 15–18 cm. long, 12 cm. wide, rounded at the apex, very obtuse or rounded at the base; panicle 25 cm. long, with numerous large, spreading bracts, the pedicels bracteolate; calyx 3 mm. high and 7–10 mm. wide; corolla rose-garnet, almost 4 cm. long, the tube 12 mm. wide near the middle, the rounded lobes 8 mm. long.

Loreto: Florida on the Río Putumayo, 200 meters, in forest, *Klug 2022*, type.

Called "meta guais." The fruit of this tree is not known, and there is consequently some doubt regarding the proper position of the genus.

17. FERDINANDUSA Pohl

Trees or shrubs, glabrous or sparsely pubescent; stipules caducous; leaves opposite, often coriaceous, short-petiolate; flowers 4–5-parted, cymose-paniculate; calyx cupular, shortly dentate; corolla funnelform, the lobes sometimes recurved, bifid at the apex, contorted in bud, glabrous; anthers sessile, exserted or included; ovary turbinate or oblong, 2-celled; capsule globose to cylindric, bisulcate, bivalvate from the apex; seeds winged.

Corolla tube 3–4.5 cm. long; leaves with short scattered hairs on the lower surface ..... *F. loretensis.*

Corolla tube less than 1.5 cm. long; leaves glabrous ..... *F. chlorantha.*

Ferdinandusa chlorantha (Wedd.) Standl. Trop. Woods 34: 41. 1933. *Gomphosia chlorantha* Wedd. Ann. Sci. Nat. III. 10: 14. 1848. *G. laxiflora* Benth. in Hook. Kew Journ. 5: 232. 1853. *F. andina* Wedd. Ann. Sci. Nat. IV. 1: 78. 1854.

A shrub or tree 3–20 meters high or more, glabrous throughout; stipules lanceolate; leaves very shortly petiolate, the blades coriaceous, ovate to oblong, 7–12 cm. long, acuminate, rounded to acutish at the base; panicles small and dense, leafy at the base; calyx lobes very short, acute or acuminate; corolla glabrous, white or greenish, the lobes short, rounded; capsule oblong, 1.5–2.5 cm. long, 5–7 mm. wide. Neg. 249.

Loreto: Forest between Río Nanay and Río Napo, *Williams 697*. Mishuyacu, near Iquitos, 100 meters, in forest, *Killip & Smith 29902; Klug 294, 139*.—Puno: Province of Carabaya, *Weddell* (photo. of type seen, ex hb. Berol.). Perhaps also in Bolivia.

"Louro-micuna," "guacamayo." It is somewhat uncertain whether the tree of Loreto (which seems to be *F. Paxii* Winkl.) is really identical with *F. chlorantha*, but a reading of Weddell's descriptions and examination of a photograph of the type reveal no important differences. Weddell states that the tree is a typical one of the regions in which it grows, its clean, silvery trunk rising well above the surrounding trees.

Ferdinandusa loretensis Standl. Field Mus. Bot. 8: 337. 1931.

A tree 6 meters high, the branchlets sparsely puberulent or glabrate; leaves coriaceous, short-petiolate, the blades oblong-elliptic, 11–15 cm. long, abruptly short-acuminate, rounded at the base or abruptly contracted; inflorescence small and few-flowered, short-pedunculate, the flowers pedicellate; calyx teeth triangular, acute; corolla white, glabrous, the 4 lobes 8–10 mm. long; capsule oblanceolate-oblong, 3.8 cm. long, 1.4 cm. wide.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1348*, type.

18. EXOSTEMA Rich.

Shrubs or trees; stipules distinct or short-connate, persistent or deciduous; leaves opposite, petiolate; flowers small or large, axillary and solitary or arranged in panicles, 5–6-parted; calyx campanulate, lobate; corolla salverform or funnelform, the tube long or much elongate, glabrous or pilose in the throat, the lobes linear, imbricate in bud; stamens exserted, the anthers linear; capsule 2-celled, coriaceous or woody, cylindric to obovate, septicidally bivalvate; seeds imbricate, winged.

Corolla 10–12 cm. long ..... *E. maynense.*

Corolla 1.5–2.5 cm. long.

Leaf blades truncate or subcordate at the base .... *E. peruvianum.*

Leaf blades mostly acute or acutish at the base. . *E. corymbosum.*

Exostema bicolor P. & E. Nov. Gen. & Sp. 3: 32. 1845.

A small tree; leaf blades very broadly ovate or elliptic, acuminate, about 10 cm. long and 7.5 cm. wide, glabrous; flowers pubescent, in terminal, trichotomous corymbs; calyx lobes linear; corolla purplish green, pubescent, about 2.5 cm. long, the lobes oblong, equaling the tube; capsule rounded, compressed. Neg. 8603.

Huánuco: Type from Cerro San Cristóbal, near Cochero, *Poeppig.*—Without locality: *Poeppig 1352* (probably the original collection).

The species is not included in the key because I am unable to separate it, by description, from *E. peruvianum* and *E. corymbosum.* Probably it is not specifically distinct from *E. peruvianum.*

Exostema corymbosum (R. & P.) Spreng. Syst. Veg. 1: 706. 1825. *Portlandia corymbosa* R. & P. Fl. 2: 49. *pl. 190, f. a.* 1799.

A tree 4–6 meters high; leaves short-petiolate, subcoriaceous, the blades ovate to oblong, mostly 7–10 cm. long, acute or acuminate, glabrous or sparsely pubescent beneath; flowers in terminal, leafy, many-flowered corymbs; calyx lobes elongate, linear; corolla white or purplish white, pubescent outside, about 2 cm. long, the lobes linear, equaling the tube; capsule ferruginous, 8 mm. long. Neg. 8602.

Cajamarca: Province of Hualgayoc, *Weberbauer 4166.*—Huancavelica: Tayacaja, *Weberbauer 6482.*—Huánuco: Described from Chaclla and Muña, *Ruiz & Pavón.* Muña, 2,100 meters, dry steep slope, *3972.*

Exostema maynense P. & E. Nov. Gen. & Sp. 3: 31. 1845.

A tree, sometimes 20 meters high, with red wood; leaves petiolate, rather thin, oblong to broadly ovate, acuminate, glabrous, 7–15 cm. long; flowers cymose-corymbose, terminal; calyx 5–6-dentate, the teeth broad, short-acuminate; corolla 10–12 cm. long, the lobes linear, one-third as long as the tube; capsule obovoid, acute at the base, 3 cm. long. Neg. 251.

Loreto: Forests of Mainas near Yurimaguas, *Poeppig* (photo. of type seen, ex hb. Berol.). Mainas, *Poeppig D2392.* Middle Marañón, *Tessmann 4888.* Balsapuerto, 220 meters, *Klug 3064;* a tree of 15 meters with white flowers.—Without locality: *Poeppig 3076,* probably the type collection.

"Puca yanta." Poeppig reports that the very bitter bark was used in domestic medicine. The flowers are said to have the odor of orange blossoms.

Exostema peruvianum Humb. & Bonpl. Pl. Aequin. 1: 133. *pl. 38.* 1808.

A shrub 3–3.5 meters high, the trunk 10 cm. in diameter; leaves ovate or broadly oblong, coriaceous, acute, 5–7.5 cm. long, glabrous, the upper ones sessile and cordate at the base; flowers fragrant, in dense, leafy, terminal corymbs; calyx lobes lanceolate, acute; corolla pink, pubescent, 2 cm. long, the lobes linear, spreading, equaling the tube. Neg. 563.

Huánuco: Casapí, *Mathews 1450.* Type from the Andes of Peru (photo. seen, ex hb. Berol.).—Department uncertain: Callcate, *Jelski 366.*

Probably this is not distinct from *E. corymbosum.*

19. COUTAREA Aubl.

Shrubs or trees, the branches with conspicuous elevated lenticels; stipules persistent; leaves opposite, short-petiolate, rather thin; inflorescence terminal or axillary, the flowers mostly solitary or ternate, usually large and showy, asymmetric, 5–8-parted; calyx cupular, lobate; corolla tubular-campanulate, often gibbous and somewhat bilabiate, the lobes contorted or imbricate, the throat glabrous; stamens inserted at the base of the tube, included or exserted, the anthers linear; capsule compressed contrary to the partition, obovate, woody or coriaceous; seeds broadly winged.

Coutarea hexandra (Jacq.) Schum. in Mart. Fl. Bras. 6, pt. 6: 196. 1889. *Portlandia hexandra* Jacq. Sel. Stirp. 63. *pl. 182, f. 20.* 1763. *C. speciosa* Aubl. Pl. Guian. 1: 314. *pl. 122.* 1775. *Bignonia triflora* Pav. ex DC. Prodr. 9: 148. 1845, in syn.

A shrub or small tree; leaves lanceolate to ovate or elliptic, mostly 7–13 cm. long, acute or acuminate, acute to rounded at the base, nearly glabrous; flowers chiefly in terminal clusters of 2–3; corolla whitish or greenish, 4–5 cm. long; capsules 2–3.5 cm. long, broadly rounded at the apex, marked with numerous pale lenticels.

Loreto: Río Masana, *Williams 158.*—Without locality, *Pavón;* type material of *Bignonia triflora.* Widely distributed in tropical America.

The bark is bitter, and in some regions it has been employed in domestic medicine as a substitute for quinine. In Brazil the species is called "quina do Piauhy," "quina do Pernambuco," and "murta do mato."

Coutarea hexandra var. *tarapotensis* Schum. (in Mart. Fl. Bras. 6, pt. 6: 198. 1889) was based upon *Spruce 4943* from Tarapoto. It is merely a form with unusually large leaves.

20. POGONOPUS Klotzsch

Shrubs or trees; stipules almost free, deciduous; leaves opposite, herbaceous, petiolate; flowers showy, in opposite-branched panicles, 5-parted; calyx tubular, lobate, one of the lobes often expanded into a large, brightly colored limb; corolla tubular, the short lobes valvate in bud, the tube somewhat curved, pilose within above the base; stamens inserted in the upper part of the tube, unequal, the anthers sagittate; capsule subglobose, 2-celled, loculicidally bivalvate; seeds numerous, minute, horizontal, compressed and marginate.

Pogonopus tubulosus (DC.) Schum. in Mart. Fl. Bras. 6, pt. 6: 265. 1889. *Calycophyllum tubulosum* DC. Prodr. 4: 367. 1830.

A shrub or tree 2–5 meters high or larger; leaves short-petiolate, the blades ovate, obovate, or elliptic, large, short-acuminate, densely pubescent or glabrate; stipules 3–4 mm. long; calyx 2 mm. long, the lobes subulate; corolla pale lilac, 3.5 cm. long, minutely puberulent or glabrate; enlarged sepal with a rounded, pink blade as much as 12.5 cm. broad; capsule woody, 7 mm. long.

Cuzco: Chanchamayo, Lares Valley, 1,000 meters, *Weberbauer 7940.*—Junín: La Merced, 700 meters, in thickets, *Killip & Smith 23811.*—Madre de Dios: Seringal San Francisco, Río Acre, *Ule 9848.* Also in Brazil, Bolivia, and Argentina. "Quina" (Bolivia).

The tree is an exceedingly showy one when in flower, because of the enlarged and brilliantly colored calyx lobes.

21. CONDAMINEA DC.

Shrubs or trees; stipules often bipartite; leaves opposite, often large and coriaceous; flowers mostly large, 5-parted, disposed in large, terminal panicles; calyx campanulate, truncate or dentate, deciduous; corolla salverform, pubescent in the throat, the lobes valvate; stamens inserted in the corolla throat, the filaments subulate, pilose at the base; capsule usually pyriform and truncate at the apex, bisulcate, loculicidally bivalvate, more or less woody; seeds horizontal, minute, angled, compressed.

Calyx scarcely 1 mm. long. Leaves petiolate.....*C. microcarpa.*

Calyx 5–7 mm. long.

Leaves sessile or nearly so, acuminate.....*C. corymbosa.*

Leaves long-petiolate, very obtuse.....*C. macrophylla.*

Condaminea corymbosa (R. & P.) DC. Prodr. 4: 402. 1830; Schum. in Mart. Fl. Bras. 6, pt. 6: 257. *pl. 124.* 1889. *Macrocnemum corymbosum* R. & P. Fl. 2: 48. *pl. 189.* 1799.

A shrub or small tree 1–6 meters high, glabrous or nearly so, with stout branches; leaves mostly sessile and clasping, oblong to obovate, 20–60 cm. long or larger, cordate at the base, coriaceous; cymes corymb-like, large, long-stalked, many-flowered; corolla 2.5 cm. long, reddish outside, whitish or cream-colored within; capsules about 1.7 cm. long, obtuse or acutish at the base. Neg. 567.

Huánuco: Described from Chinchao, Acomayo, Pillao, and Muña, *Ruiz & Pavón.* Yanano, 1,800 meters, open hillside, *3662.*

Pampayacu, *Kanehira 107*.—Junín: Huacapistana, 2,000 meters, *Killip & Smith 24130*. Chanchamayo, *Martinet 1412*. La Merced, 700 meters, wooded valley, *Killip & Smith 23506*.—San Martín: San Roque, 1,400 meters, in forest, *Williams 7794*. Bolivia to Panama.

"Sauco" (*Williams*); "ccaratu" (*Ruiz & Pavón*). Ruiz and Pavón state that the bark, although not very bitter, was used as an adulterant of cinchona bark.

Condaminea corymbosa var. **pubescens** Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 258. 1889. *C. angustifolia* Rusby, Mem. Torrey Club 6: 45. 1896.

Leaves densely and finely pubescent beneath, often short-petiolate; inflorescence finely and densely pubescent.

Ayacucho: Carrapa, 1,000 meters, wooded hillside, *Killip & Smith 22449*.—Cuzco: San Miguel, Urubamba Valley, 1,800 meters, *Cook & Gilbert 913*.—San Martín: Near Tarapoto, *Spruce 4579*, type. Zepelacio, 1,100 meters, a tree of 5 meters, *Klug 3672*. Also in Bolivia.

Condaminea glabrata DC. Prodr. 4: 402. 1830. *Macrocnemum glabratum* Bartl. ex DC. loc. cit. as syn.

Leaves obovate, short-acuminate, cuneate-attenuate at the base, glabrous; panicle glabrous, the flowers glomerate.

Huánuco: Type from the mountains of Huánuco, *Haenke*.

The species is known to the writer only from the brief original description.

Condaminea macrophylla P. & E. Nov. Gen. & Sp. 3: 30. 1845.

A tree 10–13 meters high; leaves long-petiolate, the blades oval, 30–40 cm. long, about 25 cm. wide, very obtuse, rounded or cordate at the base, glabrous; inflorescence 20–30 cm. long, the flowers pedicellate; calyx irregularly dentate, sericeous within.

Loreto: Type from forests of Yurimaguas, *Poeppig 2463*.

Schumann (in Mart. Fl. Bras.) states that this plant may be a *Rustia* rather than a *Condaminea*.

Condaminea microcarpa (R. & P.) DC. Prodr. 4: 402. 1830. *Macrocnemum microcarpum* R. & P. Fl. 2: 49. *pl. 188, f. a*. 1799.

A slender shrub or small tree; leaves petiolate, the blades elliptic or oblong-elliptic, obtusely acuminate, obtuse at the base, glabrous above, short-pilose beneath; flowers racemose-paniculate, sessile,

clustered; bracts ovate, obtuse, ciliate; corolla small, white; calyx cupular, 0.8 mm. long, shallowly dentate; capsule turbinate or oval, 3.5–4 mm. long, the seeds minute.

Huánuco: Described from Chinchao and Cochero, *Ruiz & Pavón.*

Although I have seen a specimen of this species, in the Delessert Herbarium, I am doubtful as to its proper generic position. It is scarcely a species of *Condaminea.*

Condaminea venosa (R. & P.) DC. Prodr. 4: 402. 1830. *Macrocnemum venosum* R. & P. Fl. 2: 49. *pl. 190, f. b.* 1799.

A shrub 3.5 meters high; leaves petiolate, the blades oblong-elliptic, acutely acuminate, conspicuously nerved, puberulent on the nerves; flowers small, white, sessile, in terminal panicles.

Cuzco: Acomayo and Pati, *Pavón.*

Scarcely a true *Condaminea;* perhaps a species of *Chimarrhis.*

22. CHIMARRHIS Jacq.

Trees; stipules interpetiolar, acuminate, caducous; leaves opposite, short-petiolate; flowers very small, in pedunculate, axillary, corymbiform panicles, 5-parted; calyx cupuliform, dentate or truncate; corolla short-funnelform, the lobes valvate, usually longer than the tube, villous within; stamens inserted in the corolla throat, the filaments elongate, villous below, the anthers dorsifixed; capsule small, oblong or subglobose, 2-celled, septicidally dehiscent; seeds numerous, minute, horizontal, angulate, reticulate, margined.

Calyx deeply dentate; leaves not barbate beneath in the axils of the nerves.....*C. dioica.*

Calyx shallowly dentate; leaves barbate beneath in the axils of the nerves.

Stipules glabrous; calyx and hypanthium minutely puberulent. *C. Hookeri.*

Stipules densely sericeous outside; calyx and hypanthium glabrous. *C. Williamsii.*

Chimarrhis dioica Schum. & Krause, Bot. Jahrb. 40: 312. 1908.

A shrub 3 meters high, probably also a tree; leaves short-petiolate, the blades oblong or oblong-elliptic, 8–20 cm. long, 4–12 cm. wide, acuminate, acute at the base, often bullate and with strongly impressed veins, pilose or subtomentose beneath on the veins; flowers "dioecious," in panicles 3–6 cm. long; calyx lobes ovate, acute,

glabrous; corolla yellowish green, glabrous, rotate, 4–5 mm. long; capsule subglobose, 3 mm. long. Neg. 6.

Cajamarca: Shanyu, *Raimondi 4501, 6111, 4842; Jelski 376.* Also in Colombia and Ecuador.

Chimarrhis Hookeri Schum. in Mart. Fl. Bras. 6, pt. 6: 259. 1889.

Stipules 1–3 cm. long; leaves petiolate, the blades oblong or obovate-oblong, 10–20 cm. long, acute or subobtuse, acute at the base, glabrous except in the axils of the nerves, subcoriaceous; inflorescences chiefly terminal, ferruginous-tomentulose; calyx obscurely 5-dentate; corolla glabrous, 2 mm. long, the lobes very short, obtuse. Neg. 22786.

San Martín: Tarapoto, *Spruce 4930*, type collection.

Chimarrhis Williamsii Standl. Field Mus. Bot. 8: 162. 1930.

A tree as much as 25 meters high, with a trunk 50 cm. in diameter, the young branchlets sericeous or glabrate; stipules 13–15 mm. long; leaves petiolate, the blades obovate, 5–11 cm. long, acute or short-acuminate, cuneately narrowed to the base, beneath minutely appressed-pilosulous at first but soon glabrate; inflorescences terminal and pseudoaxillary, long-pedunculate, 6–9 cm. wide, densely many-flowered, the flowers sessile or short-pedicellate; calyx teeth triangular, ciliolate; corolla white, 2.5–3 mm. long, glabrous outside. "Tuwara," "yacu-caspi."

Loreto: Lower Río Nanay, *Williams 409* (type), *369*. Mouth of Río Santiago, upper Marañón, 160 meters, *Tessmann 4668*.

23. WARSCEWICZIA Klotzsch

Shrubs or trees; stipules glandular within at the base; leaves opposite, large, herbaceous or subcoriaceous; flowers small, 5-parted, in small, dense cymes, these forming a raceme-like panicle; calyx campanulate or cupular. 5-dentate, one of the teeth often expanded into a large, colored, foliaceous limb; corolla funnelform, villous in the throat, the short lobes imbricate; stamens inserted in the corolla throat, the filaments short or elongate; capsule small, 2-celled, septicidal, the valves entire or short-bifid; seeds minute, numerous, horizontal, marginate, reticulate.

Capsule 2–2.5 mm. long; few if any of the calyx teeth expanded into a large, colored limb.

Flowers glomerate and sessile.....*W. Schwackeana.*

Flowers not glomerate, pedicellate.....*W. ambigua.*

Capsule 4–5 mm. long; many of the calyx teeth expanded into a large, brightly colored limb.

Leaf blades acute at the base.....*W. coccinea.*

Leaf blades cordate or very obtuse at the base.....*W. cordata.*

Warscewiczia ambigua Standl., sp. nov.

Frutex vel arbor 3–10-metralis, ramulis subteretibus vel plus minusve complanatis minute puberulis, internodiis elongatis; stipulae lanceolato-oblongae 1.5 cm. longae acuminatae deciduae scaberulae; folia ut videtur parva breviter petiolata subcoriacea, petiolo crassiusculo 7–8 mm. longo puberulo; lamina elliptica 8.5–10.5 cm. longa 4.5 cm. lata abrupte subcuspidato-acuminata basi acuta et obliqua glabra vel glabrata, costa nervisque supra planis, costa subtus elevata valida, nervis lateralibus utroque latere circa 10 elevatis gracilibus fere rectis angulo acuto adscendentibus prope marginem arcuato-conjunctis, nervulis prominulis laxe reticulatis; inflorescentia terminalis ampla erecta paniculata pedunculata circa 22 cm. longa, floribus numerosissimis cymulosis, cymulis racemose dispositis paucifloris, rhachi complanata puberula, bracteis parvis triangularibus, pedicellis circa 2 mm. longis, glabris; capsula depresso-globosa costata 2.5 mm. lata basi rotundata brunnescens glabra, apice calyce subtruncato margine incurvo coronata, dente uno vel interdum dentibus 5 calycis in laminam foliaceam lanceolato-oblongam obtusam petiolatam glabram usque ad 7 mm. longam expansis; semina pallide brunnea minuta lucida punctata angulata vel subteretia.

Loreto: Cerro de Cumbasa, Tarapoto, Department of Loreto, alt. 800 meters, Sept., 1902, *E. Ule 6375* (Herb. Delessert, type).

There is considerable doubt regarding the true generic position of the plant here described, but it agrees better with *Warscewiczia* than with any other genus with which I am familiar. In many characters it is similar to *W. Schwackei* Schum., but in that the flowers are glomerate and sessile, not pedicellate.

Warscewiczia coccinea (Vahl) Klotzsch, Monatsb. Akad. Berlin 1853: 497. 1853. *Macrocnemum coccineum* Vahl, Symb. Bot. 2: 38. 1791. *W. maynensis* Wedd. Ann. Sci. Nat. IV. 1: 72. 1854. *W. Poeppigiana* Klotszch, loc. cit.

A slender shrub or tree 9 meters high or less, with depressed crown; leaves short-petiolate, the blades membranaceous, elliptic-

oblong to obovate, 15–50 cm. long, acuminate, softly pubescent or glabrate beneath; cymes racemose, small, many-flowered, pedunculate; one lobe of the calyx in many of the flowers expanded into a bright red, oblong or elliptic, petiolate limb 4–6 cm. long; corolla 5–8 mm. long, yellow.

Huánuco: Cochero, *Poeppig 1491*. Pampayacu, *Kanehira* 37. —Cuzco: *Bues 42*.—Junín: La Merced, 600 meters, wooded slope, *5328; Killip & Smith 23808; Weberbauer 1833*. Chanchamayo Valley, 1,200–1,600 meters, *Schunke 317, 406*. Above San Ramón, 1,300–1,700 meters, *Schunke A34*.—Loreto: Type of *W. maynensis* from Province of Mainas, *Poeppig*. Pongo de Manseriche, *Tessmann 4783*. La Victoria, on the Amazon, in pasture, *Williams 2748, 2693*. Caballo-cocha, in forest, *Williams 2021*. Río Itaya, *Williams 135*. San Antonio, *Williams 3438*. Yurimaguas, edge of forest, *Williams 4720*. Iquitos, *Williams 8021; Killip & Smith 27162; Huber 1307*. Without locality, *Fox* in 1911. Florida, *Klug 2121, 2147*. Río Putumayo, *Klug 1626*. Ranging to Brazil, the Guianas, and Central America.

"Puca-lisa." An exceedingly showy and handsome tree when covered with the brilliant inflorescences. Called "curacy" and "rabo de arara" in Brazil. Klug reports the Huitoto names of "rafeicoño" and "rafeicoño-ey."

Warscewiczia cordata Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 217. 1889.

A shrub or small tree 3.5–6 meters high; leaves short-petiolate, often subcoriaceous, the blades broadly elliptic or obovate to oblong, 15–30 cm. long or larger, short-acuminate, softly pilose beneath or glabrate; inflorescence like that of *W. coccinea*, the enlarged calyx lobes as much as 8 cm. long; corolla 5–6 mm. long. Neg. 70.

Junín: Colonia Perené, in thickets, *Killip & Smith 25005*.—Loreto: Pongo de Manseriche, Río Marañón, *Tessmann 3902*. Yurimaguas, in abandoned land, *Williams 3852*; *Mexia 6080*. Santa Rosa, common tree in forest, *Williams 4888*.—San Martín: Type from Tarapoto, *Spruce 4898* (photo. seen, ex hb. Berol.). Tarapoto, *Williams 5862*. Zepelacio, 1,100 meters, *Klug 3268*.

Mrs. Mexia reports the vernacular name of "shambosisa," and states that the Indians employ the juice extracted from the calyx lobes for dyeing skin.

Warscewiczia Schwackei Schum. in Mart. Fl. Bras. 6, pt. 6: 219. *pl. 115*. 1889.

A shrub or tree 3.5–10 meters high; leaves short-petiolate, coriaceous, the blades oblong to broadly elliptic, 15–25 cm. long, acuminate, acute to truncate at the base, puberulent or glabrate beneath; inflorescence spicate-paniculate, the flower clusters dense, head-like, sessile, the flowers also sessile; corolla 2 mm. long; capsule minutely pilose.

Loreto: Iquitos, in forest, 100 meters, *Williams 3701; Killip & Smith 27213*. Florida, 180 meters, in forest, *Klug 2156, 2125*. Also in the Amazon Valley of Brazil.

In aspect this tree is unlike the more common species of the genus, since the bright-colored, enlarged calyx lobes are very few—mostly at the base of the panicle—or altogether absent. Klug reports the Huitoto name as "jayacoma" or "tayacona." He states that the flowers are white.

24. RONDELETIA L.

Shrubs or small trees; leaves opposite or rarely verticillate; inflorescence terminal or axillary, cymose, corymbose, or paniculate; calyx 4–6-lobate, the lobes sometimes unequal; corolla funnelform or salverform, the short lobes imbricate; anthers dorsifixed, erect; capsule 2-celled, usually globose, chartaceous or coriaceous, loculicidally or septicidally bivalvate; seeds minute, compressed or angulate, sometimes fusiform, often winged or appendaged.

Leaves white-tomentose beneath ..... *R. peruviana.*

Leaves appressed-pilose beneath, green ..... *R. loretensis.*

Rondeletia loretensis Standl., sp. nov.

Frutex 1.5 m. altus, ramis breviter pilis adscendentibus vel adpressis pilosis gracilibus, internodiis elongatis; stipulae persistentes oblongae suberectae circa 1 cm. longae adpresso-pilosae; folia majuscula breviter petiolata firme membranacea, petiolo 1–1.5 cm. longo adpresso-piloso; lamina oblongo-oblanceolata vel anguste elliptico-oblonga 12–19 cm. longa 4–6 cm. lata longiuscule anguste acuminata basin versus sensim attenuata, supra in sicco fusca sparse pilis gracillimis longiusculis pilosa, subtus pallidior ubique sed ad nervos densius pilis longis adpresso-pilosa, costa gracili elevata, nervis lateralibus utroque latere circa 16 gracillimis prominentibus subarcuatis angulo subrecto adscendentibus in marginem desinentibus; inflorescentia terminalis 6.5 cm. longe pedunculata cymosa 5 cm. lata et fere aequialta sublaxe multiflora, floribus subsecundis fere sessilibus, ramis dense pilosis, bracteis parvis lanceolato-

oblongis; hypanthium anguste clavatum 4–5 mm. longum dense pilis brunnescentibus pilosum; sepala 2.5–3 mm. longa anguste oblongo-triangularia suberecta acuminata pilosa; corolla alba 4-loba extus pilis longis et brevibus intermixtis subsparse pilosa, tubo gracili 10 mm. longo superne vix dilatato, lobis ovalibus 3 mm. longis obtusis.

Loreto: Florida, Río Putumayo, at mouth of Río Zubineta, 180 meters, in forest, *Klug 2151* (type in herb. Field Mus. No. 668,754).

The collector reports the Huitoto name as "voiguio-ey."

Rondeletia peruviana Standl. Field Mus. Bot. 8: 342. 1931.

A tree 10 meters high, the branches whitish-tomentose; stipules 4–7 mm. long, oblong, obtuse or acutish; leaves short-petiolate, thick-membranaceous, the blades elliptic or oblong-elliptic, 6–14 cm. long, 2.5–6.5 cm. wide, acuminate, acute or rarely obtuse at the base, glabrous above, densely white-tomentose beneath; inflorescence terminal, cymose-paniculate, 4 cm. long, the flowers sessile or short-pedicellate; calyx lobes 4, oblong or narrowly triangular, acute or subobtuse; corolla white-tomentose, the tube 11–15 mm. long, the lobes rounded, 3 mm. long; capsule 6 mm. long.

Loreto: Mouth of Río Santiago, upper Marañón, 160 meters, in upland forest, *Tessmann 4223*, type.

Corolla described as olive-brown outside, the lobes white within. This species is the southernmost known in the genus, which attains its greatest development probably in Mexico.

25. DOLICHODELPHYS Schum. & Krause

Shrubs or small trees with rather large, opposite, subsessile leaves; stipules short-connate at the base, deciduous; flowers 5-parted, arranged in terminal, trichotomous cymes; calyx short, the lobes broadly ovate, acute or obtuse, accrescent in fruit; corolla funnelform, glabrous, naked in the throat, the lobes rounded, much shorter than the tube; stamens inserted slightly below the middle of the tube, the anthers oblong; ovary 2-celled, with several ovules in each cell; fruit capsular, bearing at the apex the persistent calyx.

Dolichodelphys chlorocrater Schum. & Krause, Verh. Bot. Ver. Brandenb. 50: 102. *f.* 1908.

A shrub or tree 2–6 meters high, the branchlets obscurely puberulent or glabrous; stipules ovate-lanceolate, subulate-acuminate, puberulent outside, 6–8 mm. long; leaves subsessile, rigid-herbaceous,

oblanceolate-oblong, 15–33 cm. long, 4–12 cm. wide, abruptly acuminate, gradually attenuate to the base, glabrous above and shining, minutely appressed-pilose beneath on the veins; flowers pedicellate; calyx lobes 2.5 mm. long; corolla yellow or cream-colored, the tube 10–13 mm. long, the lobes 2–2.5 mm. long; fruit oblong-ovoid, 1.5 cm. long, 7 mm. thick. Neg. 953.

Loreto: Cerro de Escalera, 1,200 meters, *Ule 6774*, type (photo. and fragm. of type seen, ex hb. Berol.). Also in Colombia.

The genus consists of a single species.

26. SICKINGIA Willd.

Trees or shrubs; stipules sometimes large, glandular within at the base; leaves opposite; flowers small or medium-sized, paniculate, 4–5-parted; calyx cupular or campanulate, truncate or dentate; corolla tubular or funnelform, usually pilose at the insertion of the stamens, the lobes short, imbricate or open in bud; stamens exserted, attached below the middle of the tube; capsule commonly globose, 2-celled, bivalvate; seeds large, horizontal, lunulate or semi-oblong, broadly winged.

Capsule oval-oblong, 6.5 cm. long; leaves 15–20 cm. wide.
S. Williamsii.

Capsule globose or depressed-globose; leaves mostly 5–8 cm. wide.
S. tinctoria.

Sickingia tinctoria (HBK.) Schum. in Mart. Fl. Bras. 6, pt. 6: 228. 1889. *Macrocnemum tintorium* HBK. Nov. Gen. & Sp. 3: 311. 1820.

A small or medium-sized tree, the young branches somewhat pubescent or almost glabrous; stipules oblong-subulate, 10–12 mm. long; leaves short-petiolate, the blades oblong or elliptic-oblong, mostly 8–15 cm. long, acute or acuminate, acute to cordate at the base, glabrous or nearly so; inflorescence sessile or short-pedunculate, dense; calyx lobes ovate or ovate-oblong, acute or obtuse; corolla 7–8 mm. long, yellowish white, turning reddish when dried, puberulent or glabrate, the short lobes rounded; capsule 1.5–2.5 cm. in diameter. Neg. 6058.

Loreto: Recreo, Yurimaguas, in forest, *Williams 4132.* Río Masana, in forest, *Williams 110.* Tira Doble, Río Nanay, *Williams 909.*—San Martín: Río Mayo, Tarapoto, *Williams 6227.* Tarapoto, *Williams 6659.* Alto Río Huallaga, *Williams 6680.* Also in Brazil and Venezuela.

"Machu sacha puca-quiro," "puca-quiru." Called "ararina," "asarauba," and "pau d'arara" in Brazil. Most of the collections cited are in fruit or are sterile, and their determination is, therefore, more or less uncertain.

In this, as in other species of the genus, the fine-grained wood turns red as soon as cut and exposed to the air. The handsome coloration, unfortunately, disappears after the wood has been exposed for some time to the sunlight. Krukoff states that the wood is yellow and very durable. He reports that the flowers have a strong and agreeable odor of vanilla.

Sickingia Williamsii Standl. Field Mus. Bot. 8: 340. 1931.

A glabrous tree; petioles very short and thick; leaf blades thick-membranaceous, elliptic-obovate, 28–40 cm. long, obtuse, acute at the base; capsules woody, 3 cm. thick; seeds semiorbicular, thin, 1.5–2 cm. long, with a thin, pale wing. "Puca quiro."

San Martín: Tarapoto, 750 meters, *Williams 5531*, type.

27. BATHYSA Presl

Shrubs or trees; stipules usually large, persistent or deciduous; leaves opposite, herbaceous or coriaceous; flowers 4–5-parted, small, in usually large, terminal panicles; calyx cupular, truncate or dentate; corolla funnelform or subrotate, the lobes imbricate, the tube pubescent within in the throat; fruit a globose or ellipsoid capsule, 2-celled, the valves woody, bifid at the apex; seeds numerous, minute, horizontal, more or less distinctly winged.

Pubescence mostly spreading; calyx truncate.....*B. obovata.*

Pubescence closely appressed; calyx deeply dentate...*B. peruviana.*

Bathysa obovata (Ruiz) Schum. ex Standl. Field Mus. Bot. 7: 280. 1931. *Macrocnemum obovatum* Ruiz in herb.

Branches densely fulvous-tomentose; stipules caducous; leaves short-petiolate, the blades broadly obovate-oblong, about 30 cm. long and 13 cm. wide, obtuse or rounded at the apex, obtuse to rounded at the base and often short-decurrent, hispidulous-pilose above, densely spreading-pilose beneath; inflorescence long-pedunculate, cymose-paniculate, many-flowered, 14 cm. long and broad; corolla 6–7 mm. long, glabrous outside, densely barbate in the throat, the lobes equaling the tube. Neg. 33.

Huánuco: Chicoplaya, in 1798, *Tafalla*, type. Also in Bolivia.

Bathysa peruviana Krause, Verh. Bot. Ver. Brandenb. 50: 96. 1909.

A shrub or tree 3–15 meters high; stipules about 4 mm. long, decidous; leaves short-petiolate, the blades obovate, 14–25 cm. long, obtuse and short-acuminate at the apex, acute at the base, sparsely appressed-pilose or sericeous beneath; flowers in rather large, long-pedunculate panicles 8–10 cm. long; calyx lobes unequal, sericeous outside; corolla white or ochroleucous, glabrous outside, the tube as long as the calyx. Neg. 32.

Amazonas: Pongo de Manseriche, Río Marañón, *Tessmann 4178.* —Junín: San Nicolás, Pichis Trail, 1,100 meters, in dense forest, *Killip & Smith 26060.*—Loreto: Yurimaguas, *Ule 6768*, type. Pumayacu, 600–1,200 meters, in forest, a tree of 5 meters with cream-colored flowers, *Klug 3222.* Balsapuerto, in forest, a tree of 6 meters with white flowers, *Klug 3053.*

28. SIPANEA Aubl.

Annual or perennial herbs with terete stems; stipules connate with the petioles; leaves opposite, short-petiolate, narrow; flowers small, commonly in terminal cymes, 5-parted; calyx divided almost to the base into narrow lobes; corolla salverform, pilose or villous in the throat, the lobes contorted in bud; stamens inserted near the middle of the corolla tube, the anthers linear; capsule 2-celled, loculicidally dehiscent from the apex; seeds numerous, minute, foveolate.

Sipanea hispida Benth. ex Wernham, Journ. Bot. 55: 173. 1917. *S. pratensis* Schum. in Mart. Fl. Bras. 6, pt. 6: 249. 1889, ex parte, non Aubl.

A slender, erect, rough-hirsute herb, apparently annual, 60 cm. high or less, branched; leaves elliptic-lanceolate to oblong-lanceolate, acute or acutish, sessile or short-petiolate; cymes dichotomous, sparsely branched, the branches often spike-like; calyx lobes linear, 3–4 mm. long; corolla pinkish or white, pilose, the tube 6–9 mm. long; capsule covered with slender hairs having enlarged bases. "Pupa quihua." Neg. 25757.

Junín: Chanchamayo Valley, 1,000–1,200 meters, *Schunke 383, 1487, 1390, 1414, 353, 352, 1524.* Puerto Yessup, 400 meters, *Killip & Smith 26270.* Porvenir, 1,500–1,900 meters, *Killip & Smith 25909.* San Ramón, 900–1,300 meters, *Killip & Smith 24788.* —Loreto: Florida, in clearing, *Klug 2285.*—San Martín: San Roque,

Williams 7409. Zepelacio, 1,200–1,600 meters, *Klug 3543.* Also in Brazil, Bolivia, and Paraguay.

29. MACBRIDEINA Standl.

Trees; stipules large, caducous; leaves opposite, short-petiolate, thick-membranaceous; inflorescence terminal, cymose-corymbose, few-flowered, the flowers large, 5-parted; calyx deeply lobate, the lobes triangular, deciduous, acuminate; corolla funnelform, glabrous within, the lobes contorted; stamens inserted in the throat of the corolla, the filaments very short, the anthers oblong-linear, exserted; capsule woody, obovoid, subcompressed, bisulcate, 2-celled, loculicidally bivalvate; seeds numerous, minute, horizontal, compressed, narrowly winged.—The genus consists of a single species.

Macbrideina peruviana Standl. Trop. Woods 20: 25. 1929.

A tree 6–12 meters high, the young branchlets short-pilose, soon glabrate; stipules oval-oblong, 2 cm. long, rounded at the apex; leaf blades obovate or obovate-oblong, 13–40 cm. long, obtuse and apiculate, cuneately narrowed to the base, glabrous above, beneath hispidulous-pilose when young but soon glabrate; branches of the inflorescence glabrous; calyx 5–6 mm. long; corolla green, glabrous, almost 5 cm. long, the lobes 2 cm. long; capsule 3 cm. long and 1.5 cm. wide.

Huánuco: Chinchao, *Ruiz & Pavón.*—Junín: La Merced, 600 meters, *5573*, type; *Killip & Smith 23783.* Above San Ramón, 1,300–1,700 meters, *Schunke A32.* Chanchamayo Valley, 1,200 meters, *Schunke 432.*

30. ELAEAGIA Wedd.

Large trees with opposite, glabrous, coriaceous leaves; stipules deciduous, glandular within at the base and exuding resin; inflorescence terminal, often large, paniculate; calyx crateriform, the limb persistent, 5-dentate; corolla salverform, small, the 5 lobes ovate, obtuse, imbricate in bud; stamens inserted in the throat of the corolla, the filaments very short, the anthers broad, subexserted; capsule globose, costate, loculicidally dehiscent, 2-celled; seeds numerous, minute, elongate.

Elaeagia Mariae Wedd. Hist. Nat. Quinq. 94. 1849.

A tall tree; leaves short-petiolate or almost sessile, the blades oblong or oblong-lanceolate, 8–17 cm. long, obtuse to acute at the

apex, acute or attenuate at the base, coriaceous, glabrous; petioles and branchlets often covered with resin; stipules connate at the base, finally free and truncate; panicles large and many-flowered, much branched, longer than the leaves, the flowers very small; calyx subtruncate; corolla yellowish green, 3 mm. long. Negs. 63, 64.

Puno: Hot forests of the Province of Carabaya, *Weddell*, type (photo. seen ex hb. Berol.).—San Martín: Zepelacio, 1,100 meters, mountain forest, a tree of 8 meters with cream-colored flowers, *Klug 3635* (determination uncertain). Also in Bolivia.

Weddell reports the vernacular name as "aceite María," and states that the plant was employed in domestic medicine.

31. PHITOPIS Hook. f.

Trees with copious pubescence; stipules caducous; leaves opposite, short-petiolate; inflorescence terminal, cymose or paniculate, the flowers large, 4–7-parted; calyx campanulate or in bud closed and irregularly rupturing; corolla funnelform, the lobes contorted in bud; fruit a 2-celled, loculicidal capsule; seeds numerous, minute, irregular, foveolate.—Only the two following species are known.

Inflorescence cymose, dense, few-flowered, congested; corolla 8–10 mm. long ..... *P. multiflora.*

Inflorescence paniculate, large, open, many-flowered; corolla about 17 mm. long ..... *P. sterculioides.*

Phitopis multiflora Hook. f. Icon. Pl. *pl. 1093*. 1871. *Hippotis multiflora* Benth. ex Schum. in Mart. Fl. Bras. 6, pt. 6: 244. 1889, in syn.

A tree 8–10 meters high; leaves very shortly petiolate, oblong or obovate-oblong, 8–20 cm. long, short-acuminate, acute to rounded at the base, hispid-pilose; inflorescence sometimes spike-like, usually shorter than the leaves; calyx 7–9 mm. long, the short lobes ovate-triangular, acute; corolla white, glabrous outside; capsule 5 mm. long. Neg. 61.

San Martín: Mountains along Río Mayo, near Tarapoto, *Spruce 4319*, type collection. Moyobamba, *Mathews 1639*. Mt. Campana, near Tarapoto, *Spruce 4834*. Zepelacio, 1,200–1,600 meters, mountain forest, *Klug 3528*.

Phitopis sterculioides Standl. Field Mus. Bot. 8: 341. 1931.

A tree 7.5–9 meters high, the branchlets densely fulvous-tomentose and subappressed-hirsute; petioles 2 cm. long; leaf blades oblong-

obovate, about 26 cm. long and 12.5 cm. wide, rounded and shortly produced at the apex, narrowed to the acute base, hirsute; panicle 23 cm. long; calyx densely fulvous-tomentose, 1 cm. long; corolla white, glabrous outside, the lobes rounded-ovate; stamens exserted, the filaments hirsute below the middle.

Junín: Eneñas, 1,600–1,900 meters, in dense forest, *Killip & Smith 25747*, type.

32. OLDENLANDIA L.

Annual or perennial herbs; stipules small, acute or acuminate, sometimes setiferous; leaves opposite, small; flowers small, axillary and terminal, paniculate, cymose, or solitary; calyx 4-parted; corolla rotate or funnelform, the throat usually glabrous, the lobes obtuse, valvate; stamens inserted in the corolla throat, with short filaments, the anthers usually exserted; fruit a small capsule, 2-celled, containing few angulate or subglobose seeds, loculicidally dehiscent.

Flowers in few-flowered cymes.....*O. corymbosa.*

Flowers solitary.....*O. herbacea.*

Oldenlandia corymbosa L. Sp. Pl. 119. 1753.

A slender, branched annual, erect or decumbent, nearly glabrous; stipules bearing 1 or more long bristles; leaves sessile or subsessile, linear or linear-lanceolate, 1–3.5 cm. long, acute to attenuate at base and apex, 1-nerved, scaberulous on the margins; cymes mostly 3-flowered, the flowers long-pedicellate; calyx lobes triangular, acuminate; corolla white or lilac, equaling or slightly longer than the calyx; capsule subglobose, 1.5–2 mm. broad.

Loreto: Mishuyacu, near Iquitos, 100 meters, in clearing, *Klug 1161, 502*. Widely distributed in the tropical regions of both hemispheres.

Oldenlandia herbacea (L.) DC. Prodr. 4: 425. 1830. *Hedyotis herbacea* L. Sp. Pl. 102. 1753.

An erect or procumbent annual, glabrous throughout, usually much branched; leaves sessile, spreading or reflexed, linear or linear-lanceolate, 1.5–7 cm. long, attenuate to each end; pedicels 8–25 mm. long; calyx lobes lanceolate, acuminate; corolla salverform, white, about equaling the calyx; capsule depressed-globose, 2.5–3 mm. long.

Loreto: Caballo-cocha on the Amazon, in clearing, *Williams 2297*. Widely distributed in the tropics of both hemispheres.

33. ARCYTOPHYLLUM Willd.

Perennials, woody or suffrutescent, erect or prostrate; stipules entire, bifid, or dentate, sometimes setiform; leaves coriaceous, small, opposite; flowers solitary or arranged in heads or cymes, terminal, usually very small; calyx 4-lobate, the lobes erect, sometimes with minute teeth interposed; corolla funnelform or salverform, the tube short or elongate, the 4 lobes valvate, glabrous or villous within; ovary 2-celled; fruit a small capsule, septicidally dehiscent; seeds few, concavo-convex, punctate.

Plants prostrate, the branches rooting, suffrutescent; flowers solitary.....*A. filiforme.*

Plants erect, shrubby; flowers solitary, glomerate, or cymose.

Corolla lobes densely short-villous within. Leaves oblong or lance-oblong, 5–8 mm. long, obtuse or acute...*A. ciliolatum.*

Corolla lobes glabrous within.

Leaves conspicuously mucronate, oblong to elliptic-oblong, usually 5–7 mm. long.....*A. setosum.*

Leaves obtuse or acute, not mucronate.

Leaves small, 1–3.5 mm. long; flowers solitary or in few-flowered head-like clusters.

Leaves linear, acute or acuminate; flowers mostly solitary. *A. Riveti.*

Leaves oblong, obtuse; flowers chiefly in few-flowered, terminal, head-like clusters.....*A. ericoides.*

Leaves larger, 5–15 mm. long; flowers usually in few- or many-flowered cymes.

Stipules almost completly covering the stems; leaves thick and rigid; inflorescence head-like.....*A. Macbridei.*

Stipules not conspicuous, not covering the stems; leaves relatively thin; inflorescence not head-like.

Corolla 6–8 mm. long.....*A. thymifolium.*

Corolla 10–12 mm. long.....*A. Weberbaueri.*

Arcytophyllum ciliolatum Standl. Field Mus. Bot. 4: 324. 1929.

A stout, erect shrub 35 cm. high or more, the branchlets bifariously puberulent; stipules broadly triangular, entire or obsoletely denticulate, puberulent; leaves sessile or subsessile, glabrous, 1-nerved; flowers terminal, sessile, mostly solitary; calyx lobes 2 mm.

long, subulate-attenuate from a triangular base, ciliolate; corolla 8 mm. long, the acuminate lobes equaling the tube; capsule subglobose, 3 mm. long.

Libertad: Mountains near Tayabamba, Prov. Pataz, 3,900 meters, *Weberbauer 7023*, type.—Without locality, *Lobb.*

Arcytophyllum ericoides (Willd.) Standl. Field Mus. Bot. 11: 182. 1936. *Hedyotis ericoides* Willd. ex R. & S. Syst. Veg. 3: 527. 1819. *Anotis ericoides* DC. Prodr. 4: 433. 1830. *H. thymifolia* var. *ericoides* Wedd. Chlor. And. 2: 44. 1857. *Arcytophyllum parvifolium* Krause, Bot. Jahrb. 40: 313. 1908. *Arcytophyllum virgatum* Standl. Field Mus. Bot. 4: 325. 1929.

An erect, stiff shrub as much as 50 cm. high, rather densely branched, the branchlets minutely puberulent; stipules connate, minutely puberulent, obtuse or acute, often dentate; leaves minute, densely fasciculate, 1–2 mm. long; inflorescences mostly 3–6-flowered, head-like; calyx lobes ovate or triangular, 1–1.5 mm. long, acute; corolla 3.5–5.5 mm. long. Negs. 225, 51.

Amazonas: Prov. Chachapoyas, *Mathews 2123*, type of *A. virgatum*.—Cajamarca: Below Hacienda La Tahona, near Hualgayoc, in open thickets, 2,600 meters, *Weberbauer 4059*, type of *A. parvifolium*. Also in Colombia and Ecuador.

I have seen a photograph of the type of *Hedyotis ericoides*, from the Willdenow Herbarium, and it appears to agree perfectly with both the recently described species listed in synonymy. It was collected in the mountains of Colombia by Humboldt and Bonpland.

Arcytophyllum filiforme (R. & P.) Standl. Field Mus. Bot. 11: 183. 1936. *Hedyotis filiformis* R. & P. Fl. 1: 57. *pl. 87, f. b.* 1798. *H. conferta* R. & P. loc. cit. *f. a.* 1798. *H. microphylla* HBK. Nov. Gen. & Sp. 3: 389. 1820. *Anotis conferta* DC. Prodr. 4: 431. 1830. *A. filiformis* DC. loc. cit. *A. microphylla* DC. op. cit. 432. 1830. *Anotis Lechleriana* Schlecht. Linnaea 28: 488. 1856. *Ereicoctis conferta* et *E. filiformis* Kuntze, Rev. Gen. 1: 281. 1891. *Mallostoma confertum* et *M. filiforme* B. & H. ex Ind. Kew. 2: 150. 1895. *Oldenlandia Lechleriana* B. & H. ex Ind. Kew. 2: 336. 1895. *Arcytophyllum confertum* Standl. Field Mus. Bot. 7: 282. 1931.

Plants prostrate and matted, the branches stout and woody or elongate and almost filiform, glabrous, usually densely leafy; stipules triangular, acute, entire or denticulate; leaves linear-lanceolate or linear, mostly 3–6 mm. long, acute and piliferous at the apex, glabrous, often ciliate; flowers terminal, solitary; calyx lobes subu-

late to linear-oblong, piliferous; corolla white, 8–10 mm. long. Negs. 22, 47, 48, 55.

Apurímac: Hualgayoc and Micuipampa, *Humboldt & Bonpland;* photo. of type of *H. microphylla.*—Cuzco: Piñasniocj, Panticaya Pass, 3,600 meters, *Cook & Gilbert 1302.* Paso de Tres Cruces, *Pennell 13861.*—Huánuco: Pillao, *Ruiz,* type material of *A. filiformis;* the species was reported by R. & P. also from Torrehuasi, Sillcai, and Achapatuma. Playapampa, 2,700 meters, sunny, rocky places, *4502.* Six miles south of Mito, 3,150 meters, grassy hills, *1832.* Fifteen miles northeast of Huánuco, 3,660 meters, common in wetter grasslands, *2185.*—Junín: Oroya, *Kalenborn 44. A. conferta* was described from the mountains of Canta and Tarma, near Hacaybamba, Collquihirca, and Mineral del Cerro de Yauricocha.—Puno: Tabina, *Lechler 2091,* type material of *Anotis pilifera; Lechler 2101,* type material of *Anotis Lechleriana.* Between Tambo de las Vacas and Muña, *Raimondi 10030.*—Without definite locality, *Weberbauer 6108.* Also in Bolivia and Ecuador.

Although *Hedyotis conferta* and *H. filiformis* were maintained as distinct species by Weddell in the *Chloris Andina,* the characters upon which they were separated do not appear to be trustworthy. I have seen a photograph of presumably authentic material of *H. filiformis* from the Berlin herbarium, and it agrees with the plant described by Weddell as *H. conferta* rather than the one which he describes and illustrates as *H. filiformis.* Ruiz and Pavón give no distinguishing characters in their descriptions of the two species, nor do their illustrations give any clue for determining the differences between what they assumed to be two species of the genus.

Arcytophyllum Macbridei Standl. Field Mus. Bot. 11: 183. 1936.

A densely branched shrub 30 cm. high or more, the stout branches densely covered by the large and conspicuous stipules, these usually with much elongate setae at the apex; leaves subsessile, lance-oblong or linear-oblong, 3–11 mm. long, glabrous, rigid, acute, lustrous, scaberulous-ciliate; flowers sessile, congested to form a small, globose, rounded head; sepals erect, acute, 2–3 mm. long, ovate-oblong; corolla 6 mm. long, glabrous outside, the lobes glabrous within; capsule subglobose, 2.5 mm. long.

Without locality: *Weberbauer 6102,* type.—Amazonas: Trail from Chachapoyas to Moyobamba, *Williams 7576.* Tambo de Laurel, between Dunia and Chachapoyas, *Raimondi 1048.*—Cajamarca: Cutervo, *Raimondi 4968, 4679; Jelski 6266.*

Arcytophyllum Riveti Dang. & Cherm. Bull. Mus. Hist. Nat. Paris 28: 434. 1922.

A stiff, erect shrub as much as 40 cm. high, rather densely branched, the branches pale, puberulent; stipules triangular, dentate; leaves revolute, 2–3.5 mm. long, glabrous, spreading or ascending and more or less imbricate; calyx lobes lanceolate, acute; corolla purplish or white, 5–6 mm. long, glabrous.

Amazonas: Chachapoyas, *Mathews 3129*.—Apurímac: Hacienda La Tahona, 3,100–3,400 meters, *Weberbauer 4024*.—Cajamarca: Hacienda Montaña de Nanchó, 2,400 meters, *Raimondi 5533*.—Piura: Below Ayavaca, 2,500 meters, *Weberbauer 6359*. Also in Ecuador.

Arcytophyllum setosum (R. & P.) Standl. Field Mus. Bot. 7: 208. 1931. *Hedyotis setosa* R. & P. Fl. 1: 57. *pl. 88, f. a.* 1798. *Anotis setosa* DC. Prodr. 4: 432. 1830. *Rachicallis setosa* Steud. Nom. Bot. ed. 2. 2: 249. 1840. *Mallostoma setosum* B. & H. ex Ind. Kew. 2: 150. 1895. *Ereicoctis setosa* Kuntze, Rev. Gen. 1: 281. 1891.

A stout, erect shrub, 60 cm. high or less, glabrous or nearly so, usually densely branched, the branches suberect; stipules ovate, glabrous, bearing several long, stiff, yellowish setae; leaves very thick and leathery, lustrous, spreading or ascending; flowers few, subcapitate at the ends of the branches; calyx lobes triangular-lanceolate, acuminate; corolla 8 mm. long, lilac outside, white within. Neg. 45.

Amazonas: Prov. Chachapoyas, 2,000–2,300 meters, *Weberbauer 4337*.—Ayacucho: Huaicani, 3,300–3,600 meters, *Pearce*.—Cajamarca: Cerro de Hualgayoc, *Raimondi 2215, 837*.—Huánuco: Mito, 2,700 meters, grassy slope, *1808*. Fifteen miles northeast of Huánuco, 3,660 meters, wet mossy bank, *2178*. Pillao, *Ruiz*, presumably type material.—Junín: Originally described from Churupayana and Huasahuasi, *Ruiz & Pavón*.—Piura: Above Huancabamba, 3,400 meters, *Weberbauer 6079*.—Department unknown: Bajasan (?), *Mathews 1506*. Also in Ecuador and Bolivia.

Arcytophyllum thymifolium (R. & P.) Standl. Field Mus. Bot. 7: 40. 1930. *Hedyotis thymifolia* R. & P. Fl. 1: 56. *pl. 88, f. a.* 1798. *H. juniperifolia* R. & P. op cit. 57. *pl. 87, f. c.* 1798. *Anotis thymifolia* et *A. juniperifolia* DC. Prodr. 4: 432. 1830. *Mallostoma juniperifolium* et *M. thymifolium* B. & H. ex Ind. Kew. 2: 150. 1895. *Ereicoctis juniperifolia* et *E. thymifolia* Kuntze, Rev. Gen. 1: 281. 1891. *Anotis thymifolia* var. *hyssopifolia* DC. Prodr. 4: 432. 1830, at

least in part. *Arcytophyllum juniperifolium* Standl. Field Mus. Bot. 7: 207. 1931.

An erect, stout, densely branched shrub, sometimes as much as 1 meter high, the branches puberulent; stipules triangular-ovate, 1–3-dentate; leaves linear, usually revolute, spreading or ascending, glabrous; flowers in small, dense or open, terminal cymes, the inflorescences sometimes reduced to 3 flowers; calyx lobes linear-lanceolate; corolla white, glabrous within. Negs. 46, 50, 226.

Amazonas: Chachapoyas, 2,700 meters, *Williams 7566*. Altos entre Balsas y Celendín, *Raimondi 1801*. Chachapoyas, in 1835, *Mathews; Mathews 2124*.—Ancash: Andamayo, *Raimondi 1688*. Caraz, 2,200–2,500 meters, *Weberbauer 3006*.—Ayacucho: Coracora, 2,600 meters, *Weberbauer 5819*.—Cajamarca: Cayacati, *Jelski 379*.—Cuzco: Ollantaitambo, 3,000 meters, open, rocky slope, *Pennell 13651; Cook & Gilbert 307, 310, 744*. Cuzco, *Rose 19073*. Dept. Cuzco, 1839–40, *Gay*. Lucay, Urubamba Valley, 3,000 meters, *Herrera 2219*. La Máquina, Urubamba Valley, 2,050 meters, *Herrera 2660*. Hacienda Tilque, Urubamba Valley, *Herrera 1705*.—Huánuco: Northwest of Mito, 3,000 meters, rocky, sunny slope, *1927*. Huánuco, *Kanehira 223*. Between Huánuco and Pampayacu, *Kanehira 72*.—Junín: *Hedyotis juniperifolia* described from mountains of Tarma and Canta, near Palcamayo, Casacamcha, and Lauricocha, *Ruiz & Pavón*. *H. thymifolia* described from Tarma and Caxatambo, *Ruiz & Pavón*. Between Tarma and Palca, 2,600–3,000 meters, *Weberbauer 1734*. Tarma, 2,100 meters, steep slope in heavy, stony soil, *1012;* open hillside, 3,100 meters, *Killip & Smith 21799*. Near Huancayo, 3,400 meters, open, rocky hillside, *Killip & Smith 22022*. Oroya, *Kalenborn 159*. Canta, Tarma, and Jauja, *Mathews 813*.—Lima: Mountains near Chosica, 1,700 meters, *Weberbauer 5322*. Matucana, 2,400 meters, in slide rock, *207*. Canta, 2,800 meters, open, rocky slope, *Pennell 14341, 14595*. Puruchuca, *Mathews 987*. Lima et Peruvia septentrionalis, *Cuming 1009*. Between Matucana and Tambo de Viso, 2,500 meters, *Weberbauer 166*. Obrajillo, *Wilkes Exped.*—Department uncertain: Without locality, *McLean; Weberbauer 5497*. Huancatango, *Barclay*. Ranging to Colombia.

The vernacular name "pisgopa-chaquín" is reported by Raimondi. The plant varies greatly in the length of the leaves, and also in the size of the corolla. There is some doubt that *Hedyotis juniperifolia* really is synonymous with *Arcytophyllum thymifolium*, for I have seen no authentic material of it. However, judging from the descrip-

tion and illustration, it is only a form with few-flowered inflorescence such as is represented by several of the collections cited above.

Arcytophyllum Weberbaueri Krause, Bot. Jahrb. 54: Beibl. 119: 42. 1916.

An erect, stout shrub, usually less than 50 cm. high, often densely branched, the young branches glabrous; stipules ovate or triangular, acute; leaves linear or lance-linear, 7–16 mm. long, rather thin, sometimes revolute, glabrous; flowers fragrant, in dense or rather open and many-flowered cymes; calyx lobes ovate-lanceolate, acute, 1.5–2 mm. long; corolla white, glabrous. Neg. 53.

Amazonas: Chachapoyas, *Mathews.*—Ancash: Below Ocros, 2,400–2,900 meters, *Weberbauer 2725.* Below Pamparomás, 2,400 meters, *Weberbauer 3194.*—Huancavelica: Between Pampano and Huaitara, 2,100 meters, *Weberbauer 5409,* type. Huaitara, 1,800–2,400 meters, *Pearce.*—Lima: Matucana, 2,400 meters, steep, rocky slope, *267;* slide rock slope, *2893.* Matucana, *Weberbauer 85.* Valley of Río Rímac, 2,400 meters, in 1882, *R. Ward.* "Lima," *Ruiz & Pavón.*—Department unknown: Southern Peru, *Pearce 867.*

It is doubtful whether this plant is more than a large-flowered form of *A. thymifolium.*

34. SCHRADERA Vahl

Glabrous, epiphytic trees or shrubs with rooting branches; stipules large, caducous; leaves opposite, coriaceous; inflorescences usually terminal, solitary or clustered, capitate and pedunculate, surrounded by a cup-like involucre; calyx cupular, truncate or obsoletely lobate; corolla salverform, the 5–10 spreading lobes valvate in bud; stamens attached at the middle of the tube, the anthers linear; ovary 2–4-celled; fruit baccate; seeds numerous, minute, suborbicular, compressed.

Schradera subandina Krause, Verh. Bot. Ver. Brandenb. 50: 99. 1908.

A glabrous, epiphytic shrub 50 cm. high; leaves short-petiolate, oblanceolate or oblong-oblanceolate, 8–12 cm. long, 3–4 cm. wide, acute or acuminate, cuneate at the base; flowers axillary, long-pedicellate, clustered; calyx truncate, 8–12 mm. long; corolla white, the tube 14–16 mm. long, the 5 lobes linear-oblong, slightly shorter than the tube; anthers exserted. Neg. 265.

Loreto: Cerro de Escalera, 1,300 meters, *Ule 6680,* type.

The plant is quite unlike most other species of the genus, and may be referable to some other group.

Schradera umbellata Presl, Bot. Bemerk. 81. 1844.

Glabrous; leaves petiolate, the blades elliptic, abruptly acuminate, acute at the base, 10 cm. long; peduncles terminal, bearing a 4-rayed umbel; flower heads surrounded by an involucre of 4 ovate, obtuse or acutish bracts.

Type from the mountains of Peru.

The plant is referred with doubt to this genus by Presl. I suspect that it may be a species of *Cephaelis*.

35. GONZALAGUNIA R. & P.

Shrubs or small trees, often with recurved or long and more or less pendent branches, the branches terete or nearly so; stipules persistent, sheathing; leaves opposite, short-petiolate or almost sessile; flowers small, in cymes arranged in spike-like inflorescences, often secund, 4–5-parted; calyx cupular, dentate or lobate; corolla salverform or funnelform, the tube often elongate, the lobes imbricate, obtuse; stamens included, inserted in the corolla tube; fruit baccate, 2- or 4-celled, lobate, depressed; seeds numerous, minute, foveolate.

Leaves densely white-tomentose beneath, rugose, the veins impressed above.....*G. dependens.*

Leaves green beneath, neither tomentose nor rugose.

Inflorescence very thick and dense, scarcely interrupted; branches pilose with long, spreading hairs.....*G. pachystachya.*

Inflorescence slender and much interrupted; branches strigose or appressed- or ascending-pilose.

Calyx lobes acute or acuminate; leaves small, mostly 1.5–4.5 cm. wide.....*G. cornifolia.*

Calyx lobes obtuse or rounded; leaves large, mostly 6–15 cm. wide.....*G. bunchosioides.*

Gonzalagunia bunchosioides Standl. Field Mus. Bot. 8: 162. 1930.

A shrub, the branches hispid-strigose; stipules 5–8 mm. long, attenuate-acuminate; leaves short-petiolate, thin, the blades ovate to broadly elliptic, 11–26 cm. long, acuminate, acute or obtuse at the base, sparsely hispidulous above, more densely so beneath; panicles

6–30 cm. long pedunculate; calyx lobes ovate or rounded, unequal; corolla white, densely appressed-pilose, the tube 4–5 mm. long, the lobes 2–2.5 mm. long; fruit 4–celled, 3.5–5 mm. wide.

Loreto: Pebas, on the Amazon, in forest, *Williams 1772*, type; also *Nos. 1597, 1910, 1680, 1756, 1794.* Mouth of Río Santiago, upper Marañón, 160 meters, *Tessmann 4254, 4364.* Also in Colombia.

Gonzalagunia cornifolia (HBK.) Standl. Field Mus. Bot. 4: 279. 1929. *Gonzalea cornifolia* HBK. Nov. Gen. & Sp. 3: 416. 1819. *Gonzalagunia panamensis* var. *cornifolia* Schum. in Mart. Fl. Bras. 6, pt. 6: 293. 1889. (?)*G. panamensis* var. *hirsuta* Schum. loc. cit. *G. panamensis* var. *longistipula* Schum. loc. cit.

A slender shrub 2–4.5 meters high with elongate branches, the branchlets densely appressed-pilose or strigose; leaves membranaceous, often almost sessile, lanceolate to ovate, usually 6–13 cm. long, long-acuminate, rounded to acutish at the base, copiously appressed-pilose; panicles spike-like, short or elongate; calyx lobes deltoid to lanceolate; corolla white, 8–10 mm. long, densely appressed-pilose; fruit white. Neg. 270.

Ayacucho: Near Kimpitiriki, 400 meters, in forest, *Killip & Smith 23043.*—Loreto: Fortaleza, *Klug 2790.* Fundo Indiana, Lower Río Nanay, in forest, *Williams 576, 374, 383, 449, 579, 386, 385, 581, 580.* Near Iquitos, common, *Williams 8227.* Balsapuerto, *Killip & Smith 28450, 28592.* Soledad, on Río Itaya, 110 meters, *Killip & Smith 29679.*—San Martín: Lamas, near Tarapoto, *Williams 6351.* Juan Jui, 400 meters, *Klug 3809.* San Roque, in forest, 1,400 meters, *Williams 7791.* Tarapoto, in forest, *Williams 6316, 6036, 6072, 6098; Mathews 1545.* Moyobamba, *Mathews 1618.* Ranging to Colombia.

"Bochata," "mullaca." *Gonzalagunia panamensis* var. *hirsuta* was based upon *Spruce 4863* from Tarapoto, which I have not seen, but probably it is referable here. Var. *longistipula* was based in part upon *Spruce 3937* from the same locality, which, also, I have not seen, but it is almost certainly synonymous with *G. cornifolia.*

Gonzalagunia dependens R. & P. Fl. 1: 56. *pl. 86.* 1798. *Gonzalea pendula* Pers. Syn. Pl. 1: 132. 1805. *Gonzalea tomentosa* H. & B. Pl. Aequin. 1: 225. *pl. 64.* 1808. *Gonzalagunia tomentosa* Kuntze, Rev. Gen. 1: 284. 1891.

A shrub 2–4.5 meters high with elongate and often drooping branches, the branchlets densely whitish-tomentose; leaves short-petiolate, thick, lanceolate or lance-oblong, 8–15 cm. long, long-

acuminate, obtuse or acute at the base, bright green and glabrous above, whitish beneath; inflorescence a long, narrow, spike-like panicle, densely tomentose; calyx lobes very short; corolla pink with white lobes, tomentose, 1 cm. long; fruit 4-celled, purple or red. Neg. 267.

Ayacucho: Carrapa, 1,500 meters, *Killip & Smith 22349, 23227.* —Cuzco: Urubamba Valley, *Weberbauer 5064.*—Huánuco: Chinchao, *Ruiz* (photo. and fragm. of type ex hb. Berol.).—Junín: La Merced, 700 meters, *Killip & Smith 23541.* Dos de Mayo, 1,800 meters, dense forest, *Killip & Smith 25855.* Extending to Colombia and Venezuela.

Gonzalagunia pachystachya Standl. Field Mus. Bot. 11: 213. 1936.

A shrub or tree as much as 6 meters high, the branches densely pilose or hirsute with stiff, spreading hairs; stipules 16–19 mm. long; leaves very shortly petiolate, ovate or oblong-ovate, 13–18 cm. long, narrowly attenuate-acuminate, obtuse or rounded at the base, sparsely short-hirsute above, densely long-pilose especially beneath along the nerves; inflorescence very dense and spike-like, sometimes 3 cm. thick, 15–22 cm. long; hypanthium densely hispidulous; sepals broadly ovate, obtuse, 1–1.5 mm. long; corolla white, hispid, the tube 7 mm. long.

Loreto: Mouth of Río Santiago, Marañón Valley, in upland forest, 160 meters, *Tessmann 4295,* type. Above Pongo de Manseriche, on steep hillside, 300 meters, *Mexia 6215.*

The flowers are white and fragrant, the inflorescences drooping.

36. ISERTIA Schreb.

Shrubs or small trees with thick branches; stipules usually 4 and distinct, glandular within; leaves large, coriaceous, opposite, petiolate, often tomentose beneath; flowers showy, arranged in large, terminal, thyrsoid panicles, usually 6-parted; calyx cupular, truncate or dentate; corolla tubular-funnelform, subcoriaceous, the short lobes imbricate, the tube pubescent in the throat; stamens exserted, the anthers linear; ovary 2–6-celled; fruit baccate, globose, containing numerous small, foveolate seeds.

Leaves glabrous.....*I. rosea.*

Leaves white-tomentose or pubescent beneath.

Corolla glabrous outside.....*I. Krausei.*

Corolla variously pubescent.

Corolla red and yellow, pubescent with short, more or less spreading hairs.

Corolla tube 2.5–3 cm. long.....*I. Weberbaueri.*

Corolla tube 3.5–4.5 cm. long.....*I. Hoehnei.*

Corolla white, pubescent with fine, appressed hairs.

Venation of the upper leaf surface conspicuously impressed; corolla tube less than 2.5 cm. long.....*I. parvifolia.*

Venation of the upper leaf surface not impressed; corolla tube 3–3.5 cm. long.....*I. alba.*

Isertia alba Sprague, Trans. Bot. Soc. Edinb. 22: 434. 1905. *Creatantha peruviana* Standl. Field Mus. Bot. 8: 344. 1931.

A shrub or tree, sometimes as much as 9 meters high; leaves long-petiolate, membranaceous, the blades obovate to broadly elliptic, 20–30 cm. long or larger, abruptly acuminate or cuspidate-acuminate, acute at the base, covered beneath with a very fine and close, white or grayish tomentum; panicles large and dense; corolla slender, white, very closely and usually sparsely sericeous, sometimes glabrate; fruit globose, red, 1 cm. in diameter.

Junín: Puerto Yessup, 400 meters, edge of woods, *Killip & Smith 26331*, type of *Creatantha peruviana*. Pichis Trail, Santa Rosa, 625–900 meters, *Killip & Smith 26202*.—Loreto: Yurimaguas, *Spruce 3878*, type collection; in forest, *Williams 7856; Killip & Smith 27966*. Mouth of Río Santiago, *Tessmann 4432*. Fortaleza, 200 meters, in forest, *Williams 4418, 4381; Klug 2792*. Sachachoro, 180 meters, in cut-over woods, *Mexia 6086, 6086a*. Colombia. "Asaquiro," "asaquiru," "asarquiro."

In the original publication of this species, the locality was given erroneously as Colombia, but this was corrected later by Wernham (see Kew Bull. 65. 1914). The plant has been confused with *Isertia hypoleuca* Benth. of the northern coast of South America, which seems not to be represented by Peruvian collections.

When the genus *Creatantha* was published by the writer, there was available very ample material of a single collection. In this all the corollas were uniformly funnelform-campanulate, the tube being nearly or quite obsolete. The flowers appeared to be normal, and there was no reason to doubt that a distinct new genus was represented. Soon after the publication of the genus, the writer received from Berlin a collection of Rubiaceae in which was the Tessmann

collection cited above. In that there were found upon the same branch corollas of the type just described and other tubular ones such as are normal for the genus *Isertia*. It seems certain, therefore, that the campanulate corollas are induced by some abnormal condition, probably by insect action, although no proof of insect activity is apparent in the specimens examined.

Isertia Hoehnei Krause, Archiv. Bot. S. Paulo 1: 115. 1925.

A large shrub or small tree; leaves rather long-petiolate, large, broadly obovate or oval, abruptly contracted at the apex and short-acuminate, acute at the base or rounded and abruptly short-decurrent, green and glabrous on the upper surface, covered beneath by a very fine and close, white tomentum; inflorescence large and many-flowered; corolla red and yellow, the tube relatively stout.

Loreto: Pebas on the Amazon, in forest, *Williams 1743*. Caballococha, in forest, *Williams 2200*. Río Putumayo, *Klug 1627*. La Chorrera, *Fox 18*. Also in Colombia.

Isertia Krausei Standl. Field Mus. Bot. 11: 216. 1936.

Branches very stout, glabrous; leaves short-petiolate, the blades coriaceous, oblong or oblanceolate-oblong, large, acuminate, attenuate to the base, glabrous and shining above, short-pilose beneath on the veins and minutely tomentose in the areoles; panicles large, rather dense, pedunculate; corolla 3.5 cm. long, with short lobes and a stout, thick tube.

Libertad: Without locality, *Weberbauer 7066*, type.

Isertia parvifolia Standl. Field Mus. Bot. 4: 278. 1929.

Sometimes a tree of 6 meters, the branchlets densely puberulent; stipules 5–7 mm. long; leaves short-petiolate, the blades coriaceous, oblong to elliptic, 12–25 cm. long, acuminate, acute at the base, glabrous above, densely and minutely white-tomentose beneath; panicles usually only 5–8 cm. long, the flowers sessile or short-pedicellate; corolla tube 22 mm. long, the oval lobes 6–7 mm. long.

Junín: Chanchamayo Valley, 1,500 meters, *Schunke 393*, type. Above San Ramón, 1,300–1,700 meters, *Schunke A27*.—San Martín: Zepelacio, 1,200–1,600 meters, in forest, *Klug 3456*. Río Mayo, *Spruce 4846*.

Isertia rosea Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 284. 1889.

A shrub or small tree, glabrous throughout; leaves slender-petiolate, shining, rather thin, the blades oblanceolate-oblong to

obovate, 12–35 cm. long, acute or acuminate at the apex, sometimes rounded and apiculate, acute or cuneately narrowed at the base; panicles large and dense; corolla rose-purple or "red," 4 cm. long, with very slender tube; ovary 4-celled; fruit globose, 6 mm. in diameter. Neg. 280.

Loreto: Manfinfa, Alto Río Nanay, river bank, *Williams 1111*. Puerto Corina, Alto Nanay, *Williams 1159*. Iquitos, *Williams 8239; Tessmann 3535*. Florida, 180 meters, *Klug 2269*. Also in Brazil, Venezuela, and the Guianas. "Isico-ey" (Huitoto name, *Klug*).

Isertia Weberbaueri Standl. Field Mus. Bot. 4: 277. 1929.

A tree 8 meters high, the branchlets glabrate; stipules 7 mm. long, the lobes obtuse; leaves rather long-petiolate, coriaceous, the blades 19–28 cm. long, glabrous above, densely and minutely white-tomentose beneath, rounded at the apex and abruptly short-acuminate, acute at the base; panicles 25 cm. long; corolla dark red with yellow throat, the tube 27 mm. long, puberulent, the oval lobes 5–6 mm. long.

Libertad: Valley of Río Mixiollo, 1,400 meters, *Weberbauer 7054*, type; *7066*.—Loreto: Caballo-cocha, in forest, *Williams 2071*.

37. COCCOCYPSELUM Sw.

Prostrate annual or perennial herbs; leaves opposite, petiolate; flowers small, blue or purple, capitate, the heads axillary, sessile or pedunculate; calyx 4-lobate, the lobes narrow; corolla funnelform, the throat glabrous, the limb 4-lobate, the lobes valvate; stamens inserted in the corolla tube; fruit baccate, ovoid or globose, 2-celled, usually blue; seeds minute, numerous, subangulate, granulate.

Heads few-flowered; leaves glabrous or with sparse, appressed pubescence.

Hypanthium usually glabrous; leaves glabrous or nearly so except for appressed hairs on the upper surface near the margin. *C. Condalia.*

Hypanthium appressed-pilose; leaves more or less appressed-pilose beneath over the whole surface.....*C. decumbens.*

Heads many-flowered; leaves densely pubescent.

Pubescence of the stems spreading; leaves mostly more or less cordate at the base.....*C. hirsutum.*

Pubescence of the stems appressed or ascending; leaves not cordate at the base.....*C. lanceolatum.*

Coccocypselum Condalia Pers. Syn. Pl. 1: 132. 1805. *Condalia repens* R. & P. Fl. 1: 54. *pl. 84, f. a.* 1798, non *Coccocypselum repens* Sw. 1788. *Coccocypselum umbellatum* Poir. Encycl. Suppl. 2: 308. 1811. *C. glabrum* Britton, Bull. Torrey Club 18: 108. 1891, non DC. 1830. *C. Brittoni* Rusby, Bull. N. Y. Bot. Gard. 4: 368. 1907.

A prostrate perennial, nearly glabrous, the stems sometimes sparsely appressed-pilose; leaves short-petiolate, the blades oblong-ovate or oblong, 2.5–6.5 cm. long, acute, acute or obtuse at the base, often purplish beneath and usually quite glabrous; peduncles longer than the petioles, slender; calyx lobes lance-linear, acute or acuminate, about equaling the hypanthium; corolla purple; berry deep blue, usually 6–7 mm. long, glabrous or nearly so.

Huánuco: *Condalia repens* described from Pillao, Cochero, and Chinchao, *Ruiz & Pavón.*—Junín: Dos de Mayo, 1,800 meters, dense forest, *Killip & Smith 25867.* East of Quimirí Bridge, near La Merced, 800–1,300 meters, dense forest, *Killip & Smith 23856.* —San Martín: San Roque, 1,400 meters, in forest, *Williams 7113, 6994.* Ranging to Paraguay, Brazil, and the Guianas.

Coccocypselum decumbens Krause, Bot. Jahrb. 40: 323. 1908.

A much-branched, prostrate perennial, the stems appressed-pilose with yellowish hairs; leaf blades ovate or oblong-ovate, 2–4.5 cm. long, acute or short-acuminate, rounded or obtuse at the base, thinly appressed-pilose or sometimes glabrate above; heads long-pedunculate, with 3 or more sessile flowers; calyx lobes linear-attenuate, twice as long as the hypanthium; corolla pale blue; berry deep blue or blackish, 5 mm. long. Neg. 261.

Huánuco: Vilcabamba, 1,800 meters, wet banks, *4974.*—Puno: Between Tambo Yuncacoya and Tambo Cachicachi, *Weberbauer 1141,* type.

Probably this is only a variant of *C. Condalia.*

Coccocypselum hirsutum Bartl. ex DC. Prodr. 4: 396. 1830.

Branches densely hirsute or hispid; stipules subulate, 3–6 mm. long; leaf blades oval to rounded-ovate, rounded to acutish at the apex, hirsute or hispid with long, spreading, yellowish hairs; peduncles 1–3 cm. long; calyx lobes linear, acute, 2.5–5 mm. long; corolla 12–14 mm. long, hirsute; fruit hirsute, 6–10 mm. in diameter. "Sapu-quina."

Huánuco: Monsón, *Weberbauer 3478.*—San Martín: San Roque, 1,400 meters, *Williams 7307.* Ranging from Bolivia to Mexico and Trinidad.

Coccocypselum lanceolatum (R. & P.) Pers. Syn. Pl. 1: 132. 1805. *Condalia lanceolata* R. & P. Fl. 1: 54. 1798. *Coccocypselum repens* HBK. Nov. Gen. & Sp. 3: 316. 1819, non Sw. 1788. *Coccocypselum canescens* Willd. ex C. & S. Linnaea 4: 139. 1829. *Tontanea canescens* Standl. N. Amer. Fl. 32: 146. 1921.

Plants rather large and much branched, prostrate; stipules linear-subulate, 3–10 mm. long; leaf blades oblong to ovate, 2–8 cm. long, acute or obtuse, obtuse or rounded at the base, densely appressed-pilose on both surfaces with fulvous hairs, or the hairs of the lower surface somewhat spreading; peduncles 1–6 cm. long; calyx lobes oblong or ovate, 2–3 mm. long, obtuse; corolla blue, 5 mm. long, densely pilose; fruit bright blue, densely pilose, 5–7 mm. in diameter.

Ayacucho: Carrapa, 1,000 meters, wooded hillside, *Killip & Smith 22462.*—Huánuco: Described from forests of Cochero and Chinchao, *Ruiz & Pavón.* Vilcabamba, 1,800 meters, steep clay banks, *4973.* La Merced, 1,200 meters, loose soil of open bank, *5762.* Chanchamayo Valley, 1,000–1,500 meters, *Schunke 1463, 1442, 361, 396, 372, 110.* Huacapistana, 1,800–2,400 meters, *Killip & Smith 24132.* Above San Ramón, 1,400 meters, *Schunke A18; Killip & Smith 24559.* Eneñas, 1,700 meters, open sphagnum bog, *Killip & Smith 25697.*—San Martín: Zepelacio, 1,200–1,600 meters, *Klug 3393.* Widely distributed in tropical America, usually at middle elevations.

38. HIPPOTIS R. & P.

Shrubs or small trees; stipules large, caducous; leaves opposite, petiolate, the blades thin; flowers large, solitary or in 2–3-flowered cymes, 5-parted, often somewhat asymmetric; calyx elongate, spathaceous or bilabiate; corolla tubular or funnelform, the short lobes plicate-valvate, the cylindric tube usually curved, glabrous within or pilose at the insertion of the stamens; stamens usually unequal, inserted at or below the middle of the tube, the anthers included; ovary 2-celled; fruit baccate, globose, the seeds numerous, small, foveolate.—Two other species are known, in Colombia and Ecuador.

Calyx bilabiate, the segments not contracted at the apex, 2–3-dentate; corolla glabrous within, the lobes minute.... *H. tubiflora.*

Calyx spathaceous or bifid, the lobes contracted and cucullate at the apex; corolla pilose within above the base, the lobes one-fifth to one-fourth as long as the tube.

Peduncles 5–8 cm. long or more..... *H. triflora.*

Peduncles 2 cm. long or less..... *H. brevipes.*

Schumann (in Mart. Fl. Bras. 6, pt. 6: 297. 1889) states that "*H. peruviana* Karst.," in his opinion, is not distinct from *H. albiflora* Karst. This seems to be the only publication of the name *peruviana*. *Hippotis albiflora* is a Colombian species, of which I have seen no Peruvian material.

Hippotis brevipes Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 298. *pl. 133, f. 2.* 1889.

A shrub 1.5–4 meters high or more, the branchlets hispid; stipules ovate-triangular, 1 cm. long; leaves short-petiolate, the blades elliptic-obovate to lance-oblong, 8–20 cm. long, abruptly acuminate, acute at the base, hispid above, rather softly pilose beneath; calyx 2 cm. long, red, hispid; corolla 3 cm. long, densely hispid, the lobes retuse, glabrous within; fruit hispid, 8 mm. in diameter. Neg. 298.

Loreto: Pumayacu, *Klug 3150.* Pongo de Cainarache, *Ule 6377, 6378; Klug 2760.* Balsapuerto, *Killip & Smith 28436.* Mouth of Río Santiago, dense forest, *Mexia 6381.*—San Martin: Río Mayo near Tarapoto, *Spruce 4375,* type collection. San Roque, in forest, *Williams 6945, 7619.* Juan Jui, 400 meters, *Klug 3882.*

Hippotis brevipes var. *ucayalina* Huber (Bol. Mus. Goeldi 4: 613. 1906) is described as differing from the type in the slender, longer (5 mm.) pedicels, the less densely hispid calyx and corolla, and the more slender corolla. Apparently it is a form of slight importance. The type is *Huber 1456* from Cerro de Canchahuaya near Tarapoto. It is described as a shrub with scarlet flowers.

Hippotis triflora R. & P. Prodr. 33. 1794; Fl. 2: 56. *pl. 201.* 1799.

A shrub 3–4.5 meters high, the branchlets hispidulous or strigose; stipules broadly oblong, 2 cm. long, subobtuse; leaves on rather short petioles, the blades obovate-oblong to obovate-elliptic, 10–18 cm. long or larger, thin, short-acuminate, acute at the base, densely soft-pilose beneath; inflorescences long-pedunculate, 2–3-flowered, the flowers short-pedicellate; calyx 1.5–2 cm. long, appressed-pilose; corolla 2 cm. long, appressed-pilose, the tube pale pink with cream-colored pubescence, the lobes rich pink; fruit globose, 8 mm. in diameter, appressed-pilose. Neg. 299.

Huánuco: Described from Cochero, Macora, and Marimarchahua, *Ruiz & Pavón.* Cochero, *Dombey.* Pampayacu, *Sawada 25.* —Junín: San Nicolás, 1,100 meters, dense forest, *Killip & Smith*

26000.—Loreto: Balsapuerto, 150–350 meters, *Killip & Smith 28436.*—Without locality: *Poeppig 1240.*

Hippotis tubiflora Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 298. 1889.

Branchlets appressed-pilose; leaves short-petiolate, the blades obovate-lanceolate or lanceolate, 8–10 cm. long, acuminate, attenuate to the base, sericeous or strigose; inflorescence short-pedunculate, 3–5-flowered; calyx 8–9 mm. long, pilose; corolla 3 cm. long, strigose, the lobes truncate and retuse; fruit globose, 1 cm. in diameter, glabrate. Neg. 297.

San Martín: Near Tarapoto, *Spruce 3949,* type collection. Pongo de Cainarachi, 230 meters, in clearing, *Klug 2621.*—Loreto: Balsapuerto, 220 meters, in forest, *Klug 3084.*

Described by Klug as a shrub of 2 meters with bright rose or flesh-red flowers.

39. SOMMERA Schlecht.

Shrubs or small trees; stipules caducous; leaves opposite, petiolate, membranaceous, the areoles between the veinlets finely lineolate; inflorescences axillary, cymose, the flowers 5-parted; calyx deeply lobate, the lobes foliaceous; corolla funnelform, the throat villous, the lobes acute; stamens inserted at the middle of the tube, included: fruit baccate, 2-celled; seeds numerous, small, smooth.

Sommera sabiceoides Schum. in Mart. Fl. Bras. 6, pt. 6: 300. *pl. 133, f. 1.* 1889.

A shrub or small tree, 1–7.5 meters high, the branchlets strigose; stipules 1.5–2 cm. long; leaves slender-petiolate, the blades oblong to obovate, 7–19 cm. long, short-acuminate, acute at the base, glabrous above, more or less strigose or sericeous beneath; cymes pedunculate, shorter than the leaves, few-flowered, the flowers subsessile; calyx lobes lanceolate or oblong, acute or obtuse, green, 9–11 mm. long; corolla white, appressed-pilose, 15–17 mm. long, the lobes 5–6 mm. long; fruit subglobose, about 8 mm. in diameter.

Loreto: Above Pongo de Manseriche, 200 meters, *Mexia 6133, 6304.* La Victoria, on the Amazon, edge of forest, *Williams 2664, 2862, 2935, 3099.* Río Nanay, *Williams 554.* Río Masana, *Williams 147.* Pebas, in forest, *Williams 1810.* Caballo-cocha, in forest, *Williams 2167, 2076.* Mishuyacu, *Klug 740, 785.* Fortaleza, Yurimaguas, *Williams 4446.* Río Huallaga, *Spruce 1645.* Parana Pura, Yurimaguas, *Williams 4603.* Iquitos, edge of forest, *Williams*

8185, 8053; Tessmann 3687; Killip & Smith 27397. Puerto Arturo, *Williams 5236.* Lower Río Huallaga, 135 meters, *Killip & Smith 29254.* Río Marañón near mouth of Río Tigre, wooded bank, *Killip & Smith 27534.* Also in Amazonian Brazil.

40. PENTAGONIA Benth.

Shrubs or trees, branched or often simple; stipules large; leaves ample, entire or pinnatifid, the areoles with numerous fine, parallel striolations; flowers large, in dense, sessile or pedunculate, axillary, trichotomous cymes, 5–6-parted; calyx tubular or spathaceous, persistent; corolla funnelform or tubular, coriaceous, the lobes valvate in bud; stamens inserted below the middle of the tube, the filaments equal or unequal, often villous at the base; fruit baccate, 2-celled, ovoid or globose; seeds numerous, small, angulate.

Leaf blades narrowed to the base, the base itself cordate. *P. subauriculata.*

Leaf blades acute or acuminate at the base.

Leaves glabrous or practically so..... *P. spathicalyx.*

Leaves densely pubescent beneath.

Leaf blades broadly obovate or oblong-obovate, with about 13 pairs of nerves..... *P. velutina.*

Leaf blades narrowly oblong-lanceolate, with 30–36 pairs of nerves.

Corolla glabrous outside; leaves 18 cm. wide.. *P. Williamsii.*

Corolla pilose; leaves 40–50 cm. wide..... *P. gigantifolia.*

Pentagonia peruviana Standl., in spite of its specific name, is actually a plant of Ecuador.

Pentagonia gigantifolia Ducke, Archiv. Jard. Bot. Rio Jan. 5: 181. 1930.

A simple tree 4–5 meters high; stipules lanceolate, 5 cm. long, brownish-tomentose; petioles very short and thick; leaf blades mostly 120–150 cm. long, or as much as 180 cm., long-cuneate at the base and gradually decurrent, acute or short-acuminate, the nerves 32–36 pairs, glabrous above, pilosulous beneath, villous-tomentose on the veins; calyx red, with the hypanthium 4 cm. long, the lobes lanceolate, acuminate, pilose outside, the hypanthium densely villous-tomentose; corolla yellow, 1.5–2 cm. longer than the calyx, the lobes broadly ovate, acuminate.

Loreto: In forest, Indiana, near the Amazon above the mouth of Río Napo, *Ducke 21682*, type.

Dr. Ducke states that this plant has the largest leaves of any dicotyledonous plant with which he is familiar.

Pentagonia spathicalyx Schum. in Mart. Fl. Bras. 6, pt. 6: 302. 1889.

A shrub or tree 1–5 meters high; stipules triangular-lanceolate, 3 cm. long or larger; leaves long-petiolate, coriaceous, the blades oblong-obovate or broadly obovate, 15–45 cm. wide or larger, acuminate, acute at the base; calyx spathaceous, 2 cm. long; bracts red; corolla white or yellowish white, with pink lobes, 3–4 cm. long, pubescent or glabrate; fruit ellipsoid, 2 cm. long. Neg. 6051.

Loreto: Mouth of Río Apaga, *Tessmann 4831*. Mishuyacu, near Río Putumayo, *Klug 1610*. Iquitos, 100 meters, in forest, *Klug 483, 159*. San Antonio, 110 meters, dense forest, *Killip & Smith 29454*. Between Yurimaguas and Balsapuerto, 150 meters, dense forest, *Killip & Smith 28222; Klug 3031*.—San Martín: Pongo de Cainarachi, *Klug 2670*. Also in Amazonian Brazil and Colombia.

Klug describes the flowers as white, rose and white, or yellow and garnet.

Pentagonia subauriculata Standl. Field Mus. Bot. 8: 347. 1931.

A shrub; leaves sessile, elliptic-obovate, 70 cm. long and 30 cm. wide, short-acuminate, appressed-pilose beneath on the veins or glabrate, with about 19 pairs of nerves; bracts red; calyx spathaceous, 2–2.5 cm. long, deeply split along one side, puberulent or glabrate; corolla white, glabrous outside, the tube 3 cm. long, the lobes ovate-triangular, 7 mm. long.

Loreto: Santa Rosa, lower Río Huallaga below Yurimaguas, 135 meters, dense forest, *Killip & Smith 28959*, type.

Pentagonia velutina Standl. Field Mus. Bot. 8: 347. 1931.

A shrub or small tree; leaf blades 40–45 cm. long and 19–25 cm. wide or larger, acute, glabrous above, densely velvety-pilose beneath; fruit globose, 2 cm. in diameter, glabrate; calyx subspathaceous, 1.5–2 cm. long, bilobate, the lobes oblong, acute.

Loreto: Puerto Arturo, Yurimaguas, in forest, 200 meters, *Williams 5280* (type), *5046*.

Pentagonia Williamsii Standl. Field Mus. Bot. 8: 167. 1930.

A shrub; leaves very shortly petiolate, the blades 80 cm. long and 16–18 cm. wide or larger, long-acuminate, long-attenuate to the

base, glabrous above, densely spreading-pilose beneath; flowers densely cymose-congested in the leaf axils; calyx 2 cm. long, bilobate to the middle, the segments oblong, obtuse, sparsely pilose or almost glabrous outside; corolla glabrous outside, the tube 2.5–3.2 cm. long, the lobes broadly ovate, acute, 4–5 mm. long.

Loreto: Pebas, on the Amazon, in forest, *Williams 1949*, type.

41. SABICEA Aubl.

Herbs or shrubs, mostly scandent and tomentose or villous; stipules commonly persistent, often broad; leaves opposite, petiolate; flowers chiefly 5-parted, small or medium-sized, in axillary heads or cymes; calyx 3–5-lobate, persistent; corolla funnelform or salverform, the throat pubescent, the lobes valvate in bud; stamens inserted in the tube, with linear anthers; ovary 3–5-celled; fruit baccate; seeds small, numerous, irregular, foveolate.

Leaves densely tomentose and usually white beneath.

Inflorescences pedunculate.....*S. Klugii.*

Inflorescences sessile.

Corolla tube 5 mm. long.....*S. cana.*

Corolla tube 20 mm. long.....*S. amazonensis.*

Leaves not tomentose.

Flowers in dense, sessile, axillary heads.....*S. villosa.*

Flowers in pedunculate heads or cymes.

Pubescence of the stems and leaves of spreading hairs.

Peduncles shorter than the cymes; bracts small, 5 mm. long or less.....*S. Pearcei.*

Peduncles longer than the cymes; bracts 15 mm. long or more.....*S. subinvolucrata.*

Pubescence of the stems and leaves appressed.

Bracts at the base of the inflorescence large and conspicuous, more or less connate.....*S. umbellata.*

Bracts small and inconspicuous, not connate..*S. paraensis.*

Sabicea amazonensis Wernham, Monogr. Sabicea 47. *pl. 5, f. 3, 4.* 1914.

A suffrutescent vine, the young stems hirsute; leaves short-petiolate, the blades acuminate, green and long-hirsute above, densely whitish-tomentose and hirsute beneath; flowers in dense,

sessile, axillary heads, subtended by large, involucre-like bracts; calyx lobes linear-lanceolate, 7–9 mm. long; corolla white, the lobes about 4 mm. long.

Loreto: Florida, Río Putumayo, 200 meters, in forest, *Klug 2085*. Also in Amazonian Brazil and Venezuela.

Sabicea cana Hook. Icon. Pl. *pl. 247*. 1840. *S. flavida* Krause, Bot. Jahrb. 40: 323. 1908.

A scandent shrub with arachnoid-tomentose branches; stipules ovate, subobtuse, 8 mm. long; leaves rather long-petiolate, broadly ovate to elliptic-oblong, acute or acuminate at each end, sparsely arachnoid and greenish above, white beneath; flowers crowded in dense sessile heads, whitish-tomentose; calyx lobes triangular; corolla white, the tube 4–5 mm. long, the lobes 2–3 mm. long; fruit pale violet.

Huánuco: Chicoplaya, *Ruiz & Pavón* (ex Wernham, Monogr. Sabicea 52. 1914).—Junín: Near La Merced, 800–1,300 meters, in forest, *Killip & Smith 23925*.—Loreto: Balsapuerto, *Klug 2882*. Habana, near Moyobamba, 800–900 meters, *Weberbauer 4568*, type of *S. flavida*. Moyobamba, *Mathews*.—San Martín: Cerro de Campana, *Spruce* (ex Wernh. loc. cit.). Also in Colombia.

Sabicea Klugii Standl., sp. nov.

Frutex scandens, ramis dense laxiuscule tomentosis et pilis longis mollibus pilosis, internodiis brevibus vel elongatis; stipulae 5–7 mm. longae late ovatae subobtusae extus dense longipilosae erectae vel subreflexae; folia mediocria breviter petiolata subcoriacea, petiolo crasso dense piloso 5–10 mm. longo; lamina ovata, late ovata vel elliptica 6–10 cm. longa 3.5–5 cm. lata acuta vel subacuminata interdum obtusa, basi acuta ad rotundata, supra dense molliter pilosa et laxe tomentosa, subtus dense laxe sordide tomentosa et praesertim ad nervos longipilosa, nervis lateralibus utroque latere circa 10 valde arcuatis; flores albi capitati numerosi, capitulis subglobosis 2 cm. diam., bracteis inconspicuis, pedunculo crasso dense pilis ochraceis adpresso-piloso usque ad 2.5 cm. longo; sepala 3 mm. longa extus dense pilosa lineari-triangularia versus apicem sensim attenuata; corolla non visa.

San Martín: Zepelacio, near Moyobamba, 1,200–1,600 meters, in clearing, *Klug 3425* (herb. Field Mus. No. 736,762, type).

Sabicea paraensis (Schum.) Wernham, Monogr. Sabicea 31. *pl. 12*. 1914. *S. umbellata* var. *paraensis* Schum. in Mart. Fl. Bras. 6, pt. 6: 304. 1889.

A scandent shrub with strigose branches; stipules brownish, oblong-ovate, 1 cm. long; leaves short-petiolate, the blades ovate to oblong, acuminate, acute or obtuse at the base, sparsely hirtous above, green and appressed-pilose beneath or glabrate; inflorescence laxly cymose, 4–5 mm. wide; calyx lobes 2–3 mm. long, subsetaceous; corolla white, sparsely strigose, the tube 1 cm. long, the oblong-linear lobes 2 mm. long; fruit deep red, sparsely strigose.

Loreto: Iquitos, in forest, *Williams 3635;* open swamp, *Killip & Smith 27210, 26983.* La Victoria, on the Amazon, in forest, *Williams 2566;* edge of forest, *Williams 2907.* Mishuyacu, near Iquitos, 100 meters, *Klug 1040.* Peña Blanca, Río Itaya, *Killip & Smith 29666.* Florida, 180 meters, *Klug 2160.* Also in Amazonian Brazil. "Ruicha-o" (Huitoto name).

Sabicea Pearcei Wernham, Monogr. Sabicea 38. *pl. 3, f. 1.* 1914.

A scandent shrub, the branches softly pilose; stipules broadly ovate, 11 mm. long; leaves slender-petiolate, the blades oblong-elliptic, acuminate, acute at the base, spreading-pilose or somewhat hirsute on both surfaces; inflorescence lax, hispidulous, the bracts lanceolate; calyx lobes subsetaceous, 4–5 mm. long; fruit white or deep purple.

Junín: Yapas, 1,350–1,600 meters, dense forest, *Killip & Smith 25598.* Also in Bolivia.

Sabicea pumila Bartl. ex DC. Prodr. 4: 440. 1830.

Type from the mountains of Huánuco, *Haenke.* Wernham (Monogr. Sabicea 75. 1914) states that he has examined the type in the De Candolle Herbarium. The material, which is very scant, does not represent a *Sabicea,* but is, perhaps, a species of *Hoffmannia.*

Sabicea subinvolucrata Wernham, Monogr. Sabicea 38. *pl. 3, f. 2, 3.* 1914.

A large vine, the branches densely soft-pilose, finally glabrate; leaves short-petiolate, the blades elliptic to oblong, about 10 cm. long and 4.5 cm. wide, long-acuminate, acute at the base, hispidulous above, strigose beneath; stipules broadly ovate, 8–9 mm. long, deflexed; inflorescence lax or dense, many-flowered; calyx lobes linear or linear-lanceolate, 4 mm. long; corolla white, 7–8 mm. long, sparsely strigose.

San Martín: Type collected near Tarapoto, *Spruce 4370.* San Roque, in forest, *Williams 7106.*

Sabicea umbellata (R. & P.) Pers. Syn. Pl. 1: 203. 1805. *Schwenkfelda umbellata* R. & P. Fl. 2: 55. *pl. 200, f. a.* 1799. *Sabicea umbellata* var. *genuina* Schum. in Mart. Fl. Bras. 6, pt. 6: 304. 1889.

A scandent shrub with strigose or glabrate branches; stipules large, ovate; leaves petiolate, the blades elliptic or ovate, acuminate, strigose on the nerves, at least beneath, elsewhere glabrate; inflorescence lax, many-flowered, the flowers pedicellate; bracts ovate or lanceolate; calyx lobes linear-setaceous, 5 mm. long or more; corolla white, strigose.

Huánuco: Originally described from Cochero, Macora, and Chinchao, *Ruiz & Pavón* (specimen collected by Ruiz seen, ex hb. Berol.). Cochero, *Dombey 561* (ex Wernham).—Without locality: *Mathews* 1951. Wernham reports also *Poeppig 43* and *1226*.

Sabicea villosa R. & S. Syst. Veg. 5: 265. 1819. *S. hirsuta* HBK. Nov. Gen. & Sp. 3: 417. 1820.

A large, herbaceous or suffrutescent vine with hirsute branches; stipules brownish, broadly ovate, reflexed; leaves short-petiolate, the blades elliptic-oblong to ovate, acuminate, hirsute; flowers densely crowded in the leaf axils, sessile; calyx lobes linear-lanceolate; corolla white, strigose, the tube 6 mm. long; fruit oval, purple, 1 cm. long, juicy. "Puchen-mullaca." Neg. 302.

Ayacucho: Prov. Huanta, *Raimondi 10420*.—Huánuco: Pillao, *Ruiz*.—Junín: San Nicolás, 1,100 meters, in forest, *Killip & Smith 26046*.—Loreto: Santa Ana, Río Nanay, *Williams 1227*. Pebas, on the Amazon, in forest, *Williams 1746*. La Victoria, in pasture, *Williams 2785*. Iquitos, *Williams 1408, 7946;* open swamp, *Killip & Smith 27211*.—Puno: Tatanara, *Lechler 2510* (ex Wernham). —San Martín: San Roque, *Williams 7469*. Tarapoto, *Spruce 4837* (ex Wernham). Widely distributed in South America, extending northward to Central America.

Sabicea villosa R. & S. var. **adpressa** (Wernham) Standl. Field Mus. Bot. 7: 52. 1930. *S. hirsuta* var. *adpressa* Wernham, Monogr. Sabicea 55. 1914.

Like the species, except that the hairs of the stems and leaves are more or less closely appressed. "Pulma de mullaca."

Loreto: Río Nanay, *Williams 329, 376, 305*. Río Masana, in forest, *Williams 107*. Caballo-cocha, in forest, *Williams 2203*. Ranging with the species.

42. HOFFMANNIA Sw.

Herbs or shrubs, simple or branched; stipules interpetiolar, free; leaves opposite or verticillate, petiolate, herbaceous or membranaceous, often marked with cystoliths; inflorescence axillary, few- or many-flowered, usually cymose, the flowers sometimes fasciculate in the leaf axils, 4-parted; calyx short, lobate; corolla salverform or short-funnelform, the lobes imbricate in bud; stamens inserted in the mouth of the corolla, the filaments short; ovary 2–4-celled; fruit baccate, juicy, the seeds numerous, minute.

Leaves glabrous beneath.

Flowers densely fascicled in the leaf axils, sessile or nearly so; leaf blades oblong-oblanceolate..... *H. aggregata.*

Flowers in pedunculate cymes, pedicellate; leaf blades elliptic or obovate-elliptic..... *H. obovata.*

Leaves variously pubescent beneath, at least along the costa.

Calyx lobes linear, 4–6 mm. long..... *H. Mathewsii.*

Calyx lobes broader, less than 2 mm. long.

Flowers densely glomerate in the leaf axils. Leaf blades oblanceolate; stems rufous-villous..... *H. Williamsii.*

Flowers in long-pedunculate cymes.

Leaves chiefly ternate, the blades oblanceolate or oblanceolate-oblong, short-petiolate..... *H. verticillata.*

Leaves opposite, the blades chiefly elliptic or obovate, long-petiolate.

Cymes about 3-flowered; leaves with conspicuous pale raphids beneath..... *H. villosula.*

Cymes several- or many-flowered; leaves without evident raphids beneath..... *H. latifolia.*

Hoffmannia aggregata (R. & P.) Schum. in Mart. Fl. Bras. 6, pt. 6: 327. 1889. *Ohigginsia aggregata* R. & P. Fl. 1: 55. *pl. 83, f. b.* 1798. *Higginsia aggregata* Pers. Syn. Pl. 1: 133. 1805. *Evosmia aggregata* Spreng. Syst. Veg. 1: 417. 1825. (?) *Higginsia angustifolia* Bartl. ex DC. Prodr. 4: 399. 1830.

A shrub 1–3.5 meters high, simple or often branched, the branches glabrous; leaves opposite, short-petiolate, long-acuminate, long-tapering to the base and often almost sessile, paler beneath; calyx lobes linear or lanceolate, 1.5–2.5 mm. long; corolla reddish yellow,

6–7 mm. long, the spreading lobes about as long as the tube; fruit oval or ellipsoid, 5–6 mm. long, reddish or purple. Neg. 372.

Huánuco: Described from Cochero, Chinchao, and Muña, *Ruiz & Pavón* (photo. and fragm. of authentic material seen, ex hb. Berol.). Casapí, *Mathews 117*. Pampayacu and Cochero, *Poeppig 1066, 1029B, 1028B*. Río Huallaga Canyon below Río Santo Domingo, 1,200 meters, in forest, *4258*. Tambillo, *Jelski 370*. Yanano, 1,800 meters, edge of spring, *4921*.—Junín: Chanchamayo Valley, 1,800 meters, *Schunke 437, 420*. Above San Ramón, 1,300–1,700 meters, *Schunke A23;* in forest, *Killip & Smith 24660*.—Without locality: *Haenke; Poeppig Add. 12*.

The type of *H. angustifolia* was collected in the mountains of Peru (Huánuco?) by Haenke. I suspect that another synonym of *H. aggregata* is *Condalia sessilis* R. & P. (Fl. 1: 54. 1798; *Coccocypselum sessile* Pers. Syn. Pl. 1: 132. 1805). Although described upon the preceding page of Ruiz and Pavón's work, the descriptions of the two plants are much alike. Certainly the plant can not be a species of *Coccocypselum*.

Hoffmannia latifolia (Bartl.) Kuntze, Rev. Gen. 1: 284. 1891. *Higginsia latifolia* Bartl. ex DC. Prodr. 4: 399. 1830.

A shrub up to 1.8 meters high, or reported, probably incorrectly, as a tree 6 meters high, the young branchlets minutely villosulous or glabrate; leaves large, herbaceous, abruptly acuminate, long-attenuate to the base, ferruginous-villosulous beneath, at least along the veins, paler beneath; cymes equaling or shorter than the petioles, the flowers pedicellate; calyx lobes broadly triangular, obtuse, very short; corolla obtuse in bud, 5 mm. long or more, glabrous outside; fruit white, pink, or wine-colored, broadly ellipsoid, 5 mm. long or more.

Ayacucho: Aina, 750–1,000 meters, dense forest, *Killip & Smith 22767*. Carrapa, 1,500 meters, *Killip & Smith 22356*.—Cajamarca: Tambillo, *Raimondi 5996*.—Huánuco: Type from the mountains of Peru, perhaps from Huánuco, *Haenke*. Pampayacu, *Kanehira 102*. —Junín: Between San Nicolás and Azupizú, 650–900 meters, dense forest, *Killip & Smith 26106*. Also in Bolivia.

Hoffmannia Mathewsii Standl. Field Mus. Bot. 4: 328. 1929.

A branched shrub, the branchlets ferruginous-tomentose; leaves ternate, short-petiolate, the blades elliptic or elliptic-ovate, 3.5–5 cm. long, long-acuminate, narrowed to the base, rusty-villosulous beneath, especially on the veins; cymes long-pedunculate, laxly

few-flowered, the pedicels 3–6 mm. long; corolla 10–11 mm. long, sparsely ferruginous-villosulous, the lobes half as long as the tube.

Amazonas: Chachapoyas, *Mathews*, type.

Hoffmannia obovata (R. & P.) Standl. Field Mus. Bot. 4: 281. 1929. *Ohigginisia obovata* R. & P. Fl. 1: 56. *pl. 85, f. b.* 1798. *Higginsia obovata* Pers. Syn. Pl. 1: 133. 1805. *Evosmia obovata* Spreng. Syst. Veg. 1: 417. 1825.

A sparsely branched shrub about 1 meter high; leaves opposite, on rather long petioles, the blades short-acuminate, attenuate to the base; cymes few-flowered, almost equaling the petioles, usually clustered, the flowers pedicellate; calyx lobes short; corolla flesh-colored, obtuse in bud, the tube short; fruits oblong, purple. Neg. 371.

Huánuco: Type from Muña, *Ruiz & Pavón* (photo. of authentic specimen seen, ex hb. Berol.).

It is probable that a synonym of this, or at least a closely related species, is *Condalia obovata* R. & P. (Fl. 1: 54. 1798; *Coccocypselum obovatum* Pers. Syn. Pl. 1: 132. 1805), which was described from Chinchao. The descriptions of the two plants certainly are strikingly similar.

Hoffmannia verticillata (R. & P.) Standl. Field Mus. Bot. 4: 281. 1929. *Ohigginsia verticillata* R. & P. Fl. 1: 55. *pl. 85, f. a.* 1798. *Higginsia verticillata* Pers. Syn. Pl. 1: 133. 1805. *Evosmia verticillata* Spreng. Syst. Veg. 1: 417. 1825.

A slender, branched shrub 1–3 meters high, the branches sparsely villous; leaves small, the blades acuminate, attenuate to the base and often almost sessile, glabrous above, puberulent or villosulous beneath along the veins; cymes mostly 3-flowered, on long, slender peduncles, usually much longer than the petioles; corolla red, 5–6 mm. long, glabrous or nearly so, the lobes shorter than the tube; fruit pink, 6–7 mm. long. Neg. 369.

Huánuco: Type from forests of Muña, *Ruiz & Pavón* (photo. seen of authentic specimen, ex hb. Berol.). Haucachi, 1,950 meters, bamboo thicket, *4164*. Muña, 1,800–2,400 meters, May, 1863, *Pearce;* in damp woods, 2,700 meters, *Pearce 138, 126*.—Junín: Carrapa, 2,700–3,200 meters, edge of forest, *Killip & Smith 24459*.

Hoffmannia villosula Standl. Field Mus. Bot. 8: 167. 1930.

A shrub 1 meter high or less, apparently simple, the young branchlets sparsely villosulous; leaf blades thin, 9–15 cm. long,

long-acuminate, acute or attenuate at the base; cymes shorter than the petioles; calyx lobes linear-attenuate, 1.2 mm. long; fruit pink or red, oval, 6–7 mm. long.

Junín: Above San Ramón, 1,400–1,700 meters, dense forest, *Killip & Smith 24817* (type), *24544*.—Huánuco: Moist forest, Cochero, *Poeppig 1445*.

Hoffmannia Williamsii Standl. Field Mus. Bot. 11: 215. 1936.

Leaves slender-petiolate, the blades thin, 8–13 cm. long, long-acuminate, long-attenuate to the base, copiously rusty-villous beneath, especially on the veins; flowers densely clustered in the leaf axils, sessile or nearly so; calyx lobes very short; fruit ellipsoid, 4–5 mm. long, glabrate.

San Martín: San Roque, 1,400 meters, edge of trail, *Williams 7369*, type. Zepelacio, near Moyobamba, in mountain forest, 1,100 meters, *Klug 3759;* flowers cream-colored.

43. BERTIERA Aubl.

Slender shrubs or small trees; stipules interpetiolar, narrow, united at the base with the petiole; leaves opposite, short-petiolate, membranaceous; flowers small, in open, terminal panicles, the branches usually dichotomous, the flowers more or less secund, 5-parted; calyx small, cupular, truncate or dentate; corolla funnelform, the lobes acute, contorted in bud; stamens inserted in the throat of the corolla; fruit baccate, 2-celled, subglobose; seeds numerous, minute, tuberculate.

Ultimate branchlets of the inflorescence short, usually 4–6-flowered; corolla 5–7 mm. long; fruit conspicuously 10-costate. *B. guianensis.*

Ultimate branches usually much elongate and 10–20-flowered; corolla 3 mm. long; fruit not costate..... *B. parviflora.*

Bertiera guianensis Aubl. Pl. Guian. 180. *pl. 69*. 1775. *Hamelia micrantha* Poepp. ex Schum. in Mart. Fl. Bras. 6, pt. 6: 324. 1889, in syn.

A slender shrub 2–4.5 meters high, the terete branches strigose or glabrate; stipules triangular, acuminate, 5–11 mm. long, erect; leaves short-petiolate, the blades oblong or ovate-oblong, 8–18 cm. long, acuminate, obtuse or acute at the base, sparsely appressed-pilose, at least on the veins; panicles narrow, 10–20 cm. long; calyx lobes triangular; corolla white or greenish white, strigose, the lobes

much shorter than the tube; fruit depressed-globose, 4 mm. broad, deep blue to almost black.

Loreto: Iquitos, 120 meters, *Williams 7944; Killip & Smith 27128.* Punchana, in forest, *Williams 3758.* Mishuyacu, 100 meters, in forest, *Klug 212.* Parana Pura, Yurimaguas, in forest, *Williams 4624.* Fortaleza, 140 meters, in forest, *Klug 2828.* Florida, 180 meters, in forest, *Klug 2164.* Yurimaguas, edge of forest, *Williams 4121.* Between Yurimaguas and Balsapuerto, 140 meters, *Killip & Smith 28373, 28246.* Yurimaguas, *Killip & Smith 29111.* Pebas, on the Amazon, *Williams 1784, 1776.* Caballo-cocha, on the Amazon, *Williams 2045, 2041.*—San Martín: Tarapoto, 750 meters, *Williams 6117, 6676.* Widely distributed in tropical America. "Ruicha-ey" (Huitoto name).

Bertiera parviflora Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 325. 1889.

A shrub 1.5–4.5 meters high, the branches appressed-pilose; leaves short-petiolate, the blades lanceolate or lance-oblong, 12–20 cm. long, long-acuminate, acute at the base, appressed-pilose beneath on the veins; inflorescence 10–20 cm. long, long-pedunculate, the branches slender, often much elongate, the flowers on very short pedicels; calyx lobes triangular-ovate; corolla white, sparsely and minutely pilose outside, the lobes much shorter than the tube; fruit blue or dark purple, 3 mm. broad. "Mullaca grande." Neg. 2774.

Loreto: Santa Rosa, 700 meters, in dense forest, *Killip & Smith 26193.* Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26477.* Pongo de Manseriche, *Mexia 6358.* Puerto Yessup, 400 meters, dense forest, *Killip & Smith 26233.*—Loreto: San Antonio, Alto Río Itaya, *Williams 3442.* Lower Río Huallaga, 200 meters, *Williams 3862.* Pebas, on the Amazon, in forest, *Williams 1725.* San Antonio, Río Itaya, *Killip & Smith 29532.* Mishuyacu, *Klug 577.* Caballo-cocha, on the Amazon, *Williams 2324, 2253.* Pinto-cocha, on the Amazon, *Williams 817.* Iquitos, *Killip & Smith 27271.* Yurimaguas, 135 meters, *Killip & Smith 29059.* Also in the Amazon Valley of Brazil.

44. HAMELIA Jacq.

Shrubs or small trees with opposite or verticillate leaves; stipules inconspicuous, finally deciduous; flowers rather small, often conspicuously secund, arranged in cymes, 5-parted; calyx short or deeply lobate; corolla tubular or funnelform and ventricose, red or yellow,

the lobes imbricate in bud; stamens adnate at base to the corolla tube, the linear anthers more or less exserted; ovary 5-celled; fruit baccate, juicy, containing many minute, foveolate seeds.

Corolla tubular, orange-red; leaves usually conspicuously pubescent beneath, mostly ternate..... *H. patens.*

Corolla much widened above, yellow or yellow and red; leaves glabrous or nearly so.

Leaves chiefly ternate; corolla 2.5 cm. long..... *H. Klugii.*

Leaves opposite; corolla 1 cm. long..... *H. lutea.*

Hamelia Klugii Standl., sp. nov.

Arbor 8-metralis, ramis gracilibus minute puberulis, internodiis brevibus, stipulis minutis; folia ternata parva petiolata papyracea, petiolo gracili ad 12 mm. longo; lamina lanceolato-oblonga vel oblongo-oblanceolata 4.5–9 cm. longa 1.5–3 cm. lata subabrupte anguste longiacuminata, basin versus longe attenuata, in sicco fusca, sublucida, supra glabra, subtus ubique minute papillosa, in axillis nervorum minute barbata, aliter glabra; flores ut videtur axillares vel terminales et fasciculati pauci, pedicellis gracilibus ad 14 mm. longis minute puberulis; hypanthium oblongum 5 mm. longum minute puberulum, sepalis lineari-oblongis obtusis viridibus 4–5 mm. longis; corolla "rubra et lutea" ventricosa extus sparse minute puberula 2.5 cm. longa, tubo 5–6 mm. tantum longo supra basin constricto, fauce corollae 1 cm. lato; antherae lineares apice exsertae 1.5 cm. longae; baccae immaturae oblongae 12 mm. longae fere glabrae.

San Martín: Zepelacio, near Moyobamba, 1,100 meters, in mountain forest, *Klug 3664* (herb. Field Mus. No. 752,938, type).

The species is an exceptionally distinct one because of its combination of ventricose corolla and ternate leaves.

Hamelia lutea Rohr ex Smith in Rees, Cycl. 5: 17. 1811.

A slender shrub 2.5–3.5 meters high; stipules 3–4 mm. long; leaves long-petiolate, membranaceous, the blades elliptic to ovate or ovate-oblong, usually 6–15 cm. long, acuminate, nearly glabrous, barbellate beneath along the costa; cymes terminal, many-flowered; calyx lobes short, triangular-subulate; corolla 1 cm. long, glabrous; fruit oblong, 6–8 mm. long. "Jutó blanco."

Amazonas: Mouth of Río Santiago, *Tessmann 3986.*—Loreto: Puerto Arturo, in forest, *Williams 5159, 5179, 4974, 5013; Killip & Smith 27721.* Fortaleza, Yurimaguas, edge of forest, *Williams*

4399. Portal, Río Huallaga, 135 meters, *Killip & Smith 29251.* Between Yurimaguas and Balsapuerto, 150 meters, dense forest, *Killip & Smith 28358.* Santa Rosa, 135 meters, in forest, *Killip & Smith 28735.*—San Martín: Pongo de Cainarachi, *Klug 2753.* Juan Jui, 230 meters, *Klug 2753.* Rumizapa, near Tarapoto, *Williams 6760.* Tarapoto, *Spruce 4231; Williams 6301.* Río Mayo, Tarapoto, in forest, *Williams 6365, 6263.* Widely distributed in tropical America, ranging from Bolivia northward.

Hamelia patens Jacq. Enum. Pl. Carib. 16. 1760. *H. erecta* Jacq. loc. cit. *H. sphaerocarpa* R. & P. Fl. 2: 69. *pl. 221, f. b.* 1799.

A shrub 1–4.5 meters high; stipules triangular, 2–4 mm. long; leaves long-petiolate, membranaceous, the blades oblong-lanceolate to ovate or broadly elliptic, mostly 8–14 cm. long, acute or acuminate, acute at the base, usually copiously short-pilose beneath; sepals broadly triangular, acute, 1 mm. long or less; corolla usually orange-red, minutely puberulent, 1–1.5 cm. long; fruit oval to subglobose, about 5–7 mm. long, red to purple or almost black.

Amazonas: Chachapoyas, *Mathews.*—Ayacucho: Aina, 750–1,000 meters, open woods, *Killip & Smith 22844, 22721.*—Cuzco: Valle Lares, *Diehl 2501d.*—Huánuco: Pampayacu, *Kanehira 197.* Posuso, 600 meters, *4679.* La Merced, edge of forest, 600 meters, *5417, 5416.*—Junín: Colonia Perené, 680 meters, *Killip & Smith 24966.* La Merced, 700 meters, in thickets, *Killip & Smith 23814, 23785.* Río Pinedo, 800 meters, thickets, *Killip & Smith 23574.*—Loreto: Iquitos, edge of forest, *Williams 3686, 1404, 1435; Killip & Smith 27132.* Puerto Arturo, abandoned lands, *Williams 5161;* in pasture, *Williams 5188.* Florida, *Klug 2062, 2219.* Río Putumayo, *Klug 1645.* Santa Rosa, in forest, *Williams 4785.* Pebas, in forest, *Williams 1775.* Mishuyacu, 100 meters, in clearing, *Klug 521, 671.* Recreo, Yurimaguas, in forest, *Williams 4159.* Balsapuerto, *Klug 2928.* Río Marañón Valley, 150 meters, dense forest, *Killip & Smith 29144.*—San Martín: Zepelacio, 1,200 meters, *Klug 3302.* Tarapoto, *Williams 5499; Spruce 4188.* Lamas, *Williams 6336.* Salavera, San Roque, in forest, *Williams 7803.*—Without locality: *Mathews 3135.* Generally distributed in tropical America; a frequent weed in cut-over land or second growth. Ranging northward to Florida. "Usiya-ey" (Huitoto name).

Hamelia sphaerocarpa, described from Chinchao, is maintained as a distinct species by Wernham (Journ. Bot. 49: 213. 1911), but it seems to differ only in having spherical rather than ellipsoid fruit, and is scarcely to be regarded as more than a minor variant.

45. BOTHRIOSPORA Hook. f.

Trees or shrubs with terete branchlets; stipules free, caducous; leaves opposite, petiolate; flowers small, 4–6-parted, arranged in terminal, opposite-branched panicles, short-pedicellate; calyx divided into 4–5 lobes; corolla short-funnelform or subrotate, the lobes contorted or imbricate in bud, reflexed, pubescent outside; stamens exserted; fruit baccate, subglobose, 4–5-celled; seeds numerous.

Bothriospora corymbosa (Benth.) Hook. f. Icon. Pl. 11: 55. *pl. 1069*. 1870; Schum. in Mart. Fl. Bras. 6, pt. 6: 329. *pl. 139*. 1889. *Evosmia corymbosa* Benth. in Hook. Journ. Bot. 3: 218. 1841.

Branches slender, glabrous; stipules 1 cm. long; leaves slender-petiolate, the blades oblong-ovate, 4–9 cm. long, acutish, obtuse at the base, glabrous; panicles pedunculate, corymbiform, 4–6.5 cm. long, lax; calyx lobes oblong, obtuse; corolla white, 5–6 mm. long, the lobes obtuse; fruit yellow, 3–5 mm. in diameter.

Loreto: Río Itaya, *Williams 118, 119*. Río Itaya, 100 meters, on inundated bank, *Mexia 6483, 6486*. Florida, dense forest, 180 meters, *Klug 2168*. Also in Amazonian Brazil and in British Guiana. "Junuisico-ey" (Huitoto name).

Schumann compares the foliage to that of the pear, and the comparison is an apt one. According to Schomburgk, who collected the original specimens in British Guiana, the wood is considered by the Indians to be poisonous, and some of them had been poisoned by using spits made from it for roasting meat over the fire. Recent collectors describe the plant as a tree of 4–8 meters, with wide-spreading branches and thick foliage, the flowers white and slightly fragrant.

46. POSOQUERIA Aubl.

Shrubs or trees; stipules subulate or foliaceous, glandular within; leaves opposite, petiolate, commonly coriaceous; flowers large and showy, terminal, cymose-corymbose or umbellate, 5-parted; calyx lobate, the segments more or less auriculate at the base; corolla funnelform or salverform, curved in bud, the lobes unequal, the tube much elongate and slender, glabrous within; stamens unequal, inserted in the mouth of the corolla, the anthers linear; fruit large, baccate, 2-celled; seeds numerous, large, irregular.

Corolla commonly 10–17 cm. long; leaf blades ovate-oblong to broadly ovate, short-acuminate ..... *P. latifolia.*

Corolla 24–27 cm. long; leaf blades oblong or narrowly oblong, long-acuminate ..... *P. longiflora.*

Posoqueria latifolia (Rudge) R. & S. Syst. Veg. 5: 227. 1819. *Solena latifolia* Rudge, Pl. Guian. 1: 26. 1806.

A glabrous tree 5–15 meters high, or sometimes only a shrub; stipules triangular and 5–10 mm. long, or sometimes foliaceous and much larger; leaf blades coriaceous, 10–20 cm. long, acute to subcordate at the base; inflorescence corymbiform, few- or many-flowered, dense, the flowers fragrant; calyx lobes ovate-triangular, acute or subobtuse; corolla white, the lobes lance-oblong, obtuse, 1.5–2 cm. long; fruit globose, about 3 cm. in diameter.

Loreto: Manfinfa, Río Nanay, in forest, *Williams 1125*. Río Nanay, in forest, *Williams 852*. Timbuchi, *Williams 998*. La Victoria, *Williams 2533, 2874*. Mainas, *Poeppig 2067*. Fortaleza, Yurimaguas, edge of forest, *Williams 4245*. San Antonio, *Killip & Smith 29472*. Santa Rosa, 135 meters, *Killip & Smith 28979*. Mishuyacu, *Klug 963*.—San Martín: Tarapoto, *Williams 6532, 6701, 6545, 6540*. Widely distributed in tropical America.

The fruit is sometimes eaten, but its flavor is not attractive. The tree is an exceptionally handsome one when in blossom.

Posoqueria longiflora Aubl. Pl. Guian. 134. *pl. 51*. 1775.

A tall shrub or small tree, glabrous throughout; stipules subulate, 7–9 mm. long; leaves short-petiolate, 10–20 cm. long, usually acute at the base; inflorescence few-flowered and umbel-like; calyx lobes triangular-ovate, acute; corolla white, the lobes linear-lanceolate, acute or subobtuse, reflexed, 3–5 cm. long; fruit subglobose, yellow, 6–8 cm. in diameter.

Loreto: Iquitos, 100 meters, *Mexia 6509*. Río Masana, *Williams 28, 168*. Mishuyacu, 100 meters, *Klug 1224*. Yurimaguas, *Poeppig 1809*.—San Martín: Tarapoto, in forest, *Williams 6101; Spruce 4571*. Also in Brazil, Colombia, and the Guianas.

The flowers are pendent, as in most other species of the genus.

47. TOCOYENA Aubl.

Unarmed shrubs or small trees; stipules chiefly caducous, glandular within; leaves opposite, petiolate, usually herbaceous; flowers large and showy, terminal, cymose, perfect, 4–6-parted; calyx cupular, dentate, glandular within; corolla funnelform or salverform, the tube greatly elongate and slender, glabrous or pubescent in the throat, the lobes obtuse or acute, contorted; stamens sessile in the corolla throat; fruit baccate, globose or oblong, 2-celled; seeds numerous, compressed, horizontal.

Leaf blades 3–7.5 cm. wide.....*T. amazonica.*
Leaf blades mostly 10–16 cm. wide.
Corolla lobes obtuse, 12 mm. long.....*T. Williamsii.*
Corolla lobes acuminate, 25–30 mm. long or more....*T. foetida.*

Tocoyena amazonica Standl. Field Mus. Bot. 8: 350. 1931.

A shrub, the branchlets puberulent or glabrate; leaves short-petiolate, membranaceous, the blades elliptic-oblong or oblanceolate-oblong, 11–21 cm. long, minutely puberulent beneath on the veins or glabrate; flowers fasciculate, few, pedicellate; calyx 4 mm. long, the teeth broadly triangular, acute; fruit globose, 2 cm. in diameter.

Loreto: Río Masana, *Williams 21*, type. Pebas, on the Amazon, in forest, *Williams 1811.*

It is doubtful whether this is distinct from *T. foetida*, but the question can not be settled until the flowers have been collected.

Tocoyena foetida P. & E. Nov. Gen. & Sp. 3: 25. *pl. 229.* 1845. *Posoqueria speciosa* Krause, Bot. Jahrb. 40: 137. 1907, nomen; Verh. Bot. Ver. Brandenb. 50: 104. 1908.

A shrub or small tree, the branchlets appressed-pilose or glabrate; stipules 7–10 mm. long, triangular, acuminate; leaves short-petiolate, blackening when dried (as in other species), the blades oblong-lanceolate to elliptic or ovate, 20–35 cm. long or larger, acuminate, acute at the base, pubescent or glabrate beneath; inflorescence head-like, sessile, few- or many-flowered; calyx 2 mm. long, the teeth subulate; corolla ochroleucous, pubescent, the very slender tube about 18–20 cm. long; fruit ellipsoid, 4.5 cm. long or larger. Neg. 317.

Loreto: La Victoria, on the Amazon, in forest, *Williams 2617.* Pebas, in forest, *Williams 1757.* Iquitos, *Tessmann 3674.* Also in Amazonian Brazil and Venezuela.

Tocoyena Williamsii Standl. Field Mus. Bot. 8: 349. 1931.

A medium-sized tree with glabrous branchlets; leaves short-petiolate, chartaceous, the blades elliptic-obovate, 15–34 cm. long, short-acuminate, cuneate-acute at the base, glabrous; inflorescence cymose, densely many-flowered, short-pedunculate, glabrous, the flowers sessile or short-pedicellate; calyx 2–2.5 mm. long, truncate; corolla tube slender, 9–9.5 cm. long; fruit globose, 7 cm. in diameter.

Loreto: Iquitos, 120 meters, *Williams 8097*, type.—San Martín: Pongo de Cainarachi, 230 meters, in forest, *Klug 2750;* a tree of 20 meters, the flowers golden yellow.

48. SPHINCTANTHUS Benth.

Shrubs or small trees, unarmed; stipules glandular within; leaves opposite, short-petiolate; flowers large, terminal, perfect, 5–6-parted, solitary or in small cymes; calyx deeply dentate; corolla salverform, the oblique lobes about equaling the tube, contorted in bud, the tube indurate at the base, more or less pubescent within; stamens inserted in the corolla throat, sessile, the anthers linear; fruit oblong or globose, 2-celled, baccate; seeds numerous, horizontal, compressed.

Sphinctanthus maculatus Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 356. 1889.

A slender shrub or small tree, 2–4.5 meters high, with glabrous branches; stipules 2–3 mm. long; leaf blades firm-membranaceous, oblong to elliptic or obovate, 10–20 cm. long, acuminate, acute or contracted at the base, glabrous above, barbellate beneath in the axils of the nerves; inflorescence cymose, few-flowered, the flowers pedicellate; hypanthium turbinate; calyx 5–6 mm. long, the lobes subulate; corolla 5–6 cm. long, white, tomentulose, the tube stout, striate, the spreading lobes rhombic, obtuse or acute; fruit orange or yellow, globose, 2–3 cm. in diameter. Neg. 314.

Junín: Cahuapanas, 340 meters, in forest, *Killip & Smith 26729*. —Loreto: Mouth of Río Santiago, *Tessmann 4229*. Huallaga, Yurimaguas, in forest, *Williams 4659*. Puerto Arturo, in pasture, *Williams 5198*. Yurimaguas, *Williams 4730*. Balsapuerto, 200 meters, *Killip & Smith 28645*. Also in Amazonian Brazil.

49. RANDIA L.

Trees or shrubs, often armed with spines; stipules small, often subconnate; leaves opposite, sessile or petiolate; flowers small or large, perfect or unisexual, often dioecious, axillary or terminal, solitary or fasciculate; calyx lobate, dentate, or truncate; corolla funnelform or salverform, with short or elongate tube, the lobes contorted in bud; stamens inserted in the corolla throat, the filaments short or obsolete; fruit baccate, commonly 2-celled, globose or oval; seeds numerous or few, mostly horizontal, compressed.

Plants armed with spines.

Corolla commonly 2–4 cm. long.

Calyx lobes linear or subulate..... *R. armata.*

Calyx lobes oblong-obovate, foliaceous..... *R. calycina.*

Corolla less than 1 cm. long.

Leaf blades glabrous or nearly so, elliptic to obovate, mostly 2–3 cm. long..... *R. boliviana.*

Leaf blades densely or sparsely pubescent, sometimes much larger.

Leaf blades orbicular or nearly so, rounded at the apex. *R. rotundifolia.*

Leaf blades obovate, acute or acuminate..... *R. obovata.*

Plants unarmed.

Stipules 3 cm. long, persistent, conspicuous..... *R. Tessmannii.*

Stipules small and inconspicuous, deciduous.

Corolla glabrous outside, the tube 20 cm. long... *R. Williamsii.*

Corolla pubescent outside.

Corolla tube 17–25 cm. long..... *R. Ruiziana.*

Corolla tube 2–3 cm. long.

Flowers pedicellate; leaves tomentose beneath. *R. aurantiaca.*

Flowers sessile; leaves not tomentose..... *R. Killipii.*

Randia armata (Sw.) DC. Prodr. 4: 387. 1830. *Mussaenda spinosa* Jacq. Sel. Stirp. 70. 1763. *Gardenia armata* Sw. Prodr. 51. 1788. *R. spinosa* Karst. Fl. Columb. 2: 128. 1869, non Poir. 1811. *Basanacantha spinosa* Schum. in Mart. Fl. Bras. 6, pt. 6: 376. 1889.

A shrub or tree 1–6 meters high, armed with stout, sharp spines 1–2.5 cm. long, the spines usually in 4's at the ends of the branchlets; stipules 3–8 mm. long; leaves petiolate, usually membranaceous, the blades ovate to obovate, mostly 5–10 cm. long, acute or acuminate at each end, minutely appressed-pilose beneath on the veins or glabrate; flowers dioecious, pedicellate, clustered; calyx lobes 4–9 mm. long; corolla white or cream-colored, the 5 lobes rhombic-obovate, about 1 cm. long, obtuse; fruit oval or globose, 1–2.5 cm. thick, yellowish or greenish.

Ayacucho: Near Kimpitiriki, 400 meters, in forest, *Killip & Smith 22863.*—Loreto: Puerto Arturo, 200 meters, in forest, *Williams 5165, 5244; Killip & Smith 27904.* Santa Rosa, in forest, *Williams 4859; Killip & Smith 28945.* Above Pongo de Manseriche, 200 meters, *Mexia 6368, 6224.* Soledad, Río Itaya, 110 meters, *Killip & Smith 29708.* Balsapuerto, *Killip & Smith 28449, 28641.*

Upper Marañón, 160 meters, *Tessmann 4623*. Yonán, Lower Huallaga, 130 meters, in forest, *Tessmann 3772*. Schumann reports also *Poeppig 2355* from Yurimaguas.—San Martín: Juan Jui, *Klug 3848*. Tarapoto, in forest, *Williams 6700, 6556*. Juan Guerra, *Williams 6918*. Morales, Tarapoto, *Williams 5674; Spruce 4246*. Río Mayo, near Tarapoto, *Spruce 4364*. Widely distributed in South America; ranging northward to Mexico and the West Indies.

"Espuela casha," "espino," "clavo-caspi." The shrub is abundant in many parts of tropical America, sometimes forming dense thickets. The flowers, although rather large, are inconspicuous, unless borne in unusual abundance. The fruit is filled with a black, slimy pulp of repulsive appearance, which nevertheless is sometimes eaten by people, although of scarcely pleasant flavor. It is much sought by birds, which extract it from a hole punctured in one side of the rind.

Randia armata var. **pubescens** (HBK.) Standl., comb. nov. *Mussaenda pubescens* HBK. Nov. Gen. & Sp. 3: 420. 1820. *Basanacantha spinosa* var. *pubescens* Schum. in Mart. Fl. Bras. 6, pt. 6: 378. 1889.

Like the species, but the leaves softly pubescent, at least beneath, or sometimes subtomentose.

Junín: Colonia Perené, 600 meters, in forest, *Killip & Smith 25139*.—Loreto: Yurimaguas, in forest, *Williams 4117; Killip & Smith 28001*. Between Yurimaguas and Balsapuerto, 150 meters, in forest, *Killip & Smith 28083*. Distributed with the species.

This probably is a form of only slight importance, and scarcely deserving of varietal rank.

Randia aurantiaca Standl. Field Mus. Bot. 4: 327. 1929.

A shrub 1–4 meters high; stipules 5–7 mm. long; leaves on short, slender petioles, membranaceous, the blades oblong-elliptic or obovate-elliptic, 4–13 cm. long, short-acuminate, usually acute at the base, pilose or puberulent above, densely tomentose beneath; flowers terminal, solitary or clustered; calyx lobes linear-subulate, 4–5 mm. long; corolla orange, densely sericeous outside, the lobes ovate-oblong, long-acuminate, 2.5 cm. long. Neg. 313.

Túmbes: Mountains east of Hacienda Chicama, 600 meters, *Weberbauer 7665*, type. Also in Ecuador.

Randia boliviana Rusby, Bull. N. Y. Bot. Gard. 4: 368. 1907.

A spiny shrub 2 meters high, or sometimes a tree of 6 meters; leaves short-petiolate, coriaceous, the blades mostly rounded at the

apex but sometimes even acute; flowers few, perfect, inconspicuous; corolla white, glabrous outside, 8 mm. long; fruit globose, 1.5 cm. in diameter.

Cajamarca: Montaña de Nanchó, 2,300 meters, *Raimondi 7638*. —Cuzco: Without definite locality, *Gay*. Also in Bolivia.

Randia calycina Cham. Linnaea 9: 246. 1834. *Basanacantha calycina* Schum. in Mart. Fl. Bras. 6, pt. 6: 375. 1889.

A spiny shrub; stipules 4–5 mm. long; leaves petiolate, membranaceous, the blades obovate-oblong to elliptic, nearly glabrous; flowers dioecious, cymose, terminal, short-pedicellate; calyx lobes green, 8–12 mm. long; corolla white, glabrous outside, 2–3 cm. long. Neg. 332.

Junín: La Merced, 1,000 meters, *Weberbauer 1946*. Also in Ecuador and Brazil.

Closely related to *R. armata*, and perhaps better treated as a variety of that species.

Randia Killipii Standl. Field Mus. Bot. 8: 170. 1930.

An unarmed shrub or tree 2.5–9 meters high; stipules ovate-triangular or lance-triangular, 5–10 mm. long; leaves membranaceous, slender-petiolate, the blades elliptic or obovate-elliptic, 11–14 cm. long, acute or short-acuminate, acute or obtuse at the base, puberulent or pilosulous beneath or glabrate; staminate flowers capitate; calyx truncate, 1.5 mm. long; corolla white, puberulent or hirtellous, the tube 3 cm. long, the lobes lance-oblong, 3.5 cm. long, acuminate; fruit globose, 2.5 cm. in diameter.

Junín: Eneñas, 1,600–1,900 meters, dense forest, *Killip & Smith 25643*.—Loreto: San Antonio, Río Itaya, dense forest, 110 meters, *Killip & Smith 29495*, type; *Williams 3508*. Soledad, Río Itaya, *Killip & Smith 29730, 29716*. Paraíso, Alto Itaya, in forest, *Williams 3372*. Also in Colombia.

Randia obovata R. & P. Fl. 2: 68. 1799. *R. pubescens* R. & P. Fl. 2: *pl. 220, f. b.* 1799. *Gardenia obovata* Dietr. Vollst. Lex. Nachtr. 3: 441. 1821.

A straggling shrub, armed with short or elongate, straight spines; leaves short-petiolate, membranaceous, mostly 3–10 cm. long, acute or attenuate at the base, densely pubescent beneath or in age glabrate; flowers perfect, axillary or lateral, solitary, sessile; corolla white or greenish yellow, 5–6 mm. long; fruit globose, yellowish, 1.5 cm. in diameter. Neg. 324.

Huánuco: Described from Muña, Posuso, and Chinchao, *Ruiz & Pavón*. Vilcabamba, 1,800 meters, forest slope, *5162*. Muña, 2,100 meters, dense forest, *4016*.—Junín: Vitoc, in 1790, *Tafalla* (photo. and fragm. ex hb. Berol.). Also in Argentina.

The specific name *pubescens*, which was used by De Candolle in the *Prodromus*, appears only on the plate, doubtless as a result of oversight on the part of the authors.

Randia rotundifolia R. & P. Fl. 2: 68. 1799.

A shrub with stout branches, armed with stiff, straight spines; leaf blades thin, mostly orbicular or obovate-rounded and 1–2 cm. long, rounded at the apex, obtuse to cuneate at the base, densely pubescent on both surfaces, or glabrate in age; flowers perfect, terminal, solitary, sessile; corolla small, white; fruit "as large as a filbert," yellowish, the pulp black. "Millucassa." Neg. 325.

Junín: Type from Huasahuasi, *Ruiz & Pavón* (photo. of authentic specimen seen, ex hb. Berol.). Below Palca, 2,600 meters, on rocks, *Weberbauer 1757*.

Randia Ruiziana DC. Prodr. 4: 388. 1830. *Randia formosa* (Jacq.) Schum. var. *longiflora* (R. & P.) Schum. in Mart. Fl. Bras. 6, pt. 6: 343. 1889. *Gardenia longiflora* R. & P. Fl. 2: 67. *pl. 219, f. a.* 1799.

An unarmed shrub or small tree; stipules 2–4 mm. long; leaves short-petiolate, ovate to oblong, acute or acuminate, acute at the base, more or less pilose beneath, membranaceous; flowers perfect, commonly solitary; corolla white, sericeous outside, the narrow lobes long-acuminate, spreading, sometimes as much as 7 cm. long, but usually shorter; fruit oblong or ellipsoid, 5–6 cm. long. Negs. 309, 311.

Huánuco: Posuso and Chacahuassi, *Ruiz & Pavón* (photo. ex hb. Berol.; type from Posuso).—Loreto: Florida, *Klug 2248, 2272*. Pebas, on the Amazon, in forest, *Williams 1921*.—San Martín: Tarapoto, *Williams 6706, 6551; Spruce 4906*.—Without locality: *Ruiz & Pavón 711*. Also in Brazil and the Guianas. "Jigu-ey," "umruyo" (Huitoto names).

"Iscumnim," "ñupchucri" (*Ruiz & Pavón*); called "sucena" in Brazil. The pulp of the fruit is edible. The shrub is remarkable for the exaggerated size of its flowers, with long and slender corolla tube.

Randia Tessmannii Standl. Field Mus. Bot. 4: 327. 1929.

An unarmed shrub, or sometimes a tree of 5 meters; stipules oblong-ovate, acute or acuminate, connate at the base, greenish, longer than the petioles; leaves short-petiolate, thick, oblong or oblong-lanceolate, 14–20 cm. long, long-acuminate, obtuse or acute at the base, nearly glabrous; staminate flowers terminal, solitary, short-pedicellate, subtended by large, stipule-like bracts; calyx 1 cm. long, dentate; corolla white, minutely sericeous, the tube 4 cm. long, the 6–7 lobes oblong or obovate, 5–5.5 cm. long, obtuse and acuminate-apiculate; fruit globose, 3 cm. in diameter.

Loreto: Río Ucayali, *Tessmann 3246*, type. Mainas, *Poeppig 2284*. Santa Rosa, in forest, *Williams 4929*. Puerto Arturo, Yurimaguas, in forest and at edge of river, *Williams 5357, 5249*.—San Martín: Juan Jui, 400 meters, *Klug 3914*.—Without locality: *Poeppig 2284*.

Randia Williamsii Standl. Field Mus. Bot. 8: 169. 1930.

A shrub, unarmed; stipules triangular-ovate, 7 mm. long; leaves membranaceous, short-petiolate, the blades narrowly oblong or lance-oblong, 11–23 cm. long, long-acuminate, acute at the base, glabrous; flowers terminal, solitary, sessile; calyx tube 1 cm. long, the 5 lobes filiform, 1.5 cm. long; corolla white, the slender tube glabrous outside, the lobes linear-lanceolate, 6.5 cm. long, long-attenuate; fruit oblong-oval, 5 cm. long, 2.5 cm. thick.

Loreto: La Victoria, on the Amazon, in forest, *Williams 2538* (type), *2531*.

50. GENIPA L.

Tall trees; stipules deciduous; leaves rather large, opposite, petiolate, subcoriaceous; flowers large, in terminal, few-flowered cymes, 5–6-parted; calyx tubular, truncate or shallowly lobate; corolla salverform or subrotate, the lobes contorted, coriaceous, the tube short, villous in the upper half; stamens inserted in the mouth of the tube, exserted, the anthers linear; fruit baccate, ovoid or subglobose, 2-celled; seeds horizontal or oblique, large, compressed.

Genipa americana L. Syst. Nat. ed. 10. 931. 1759. *G. oblongifolia* R. & P. Fl. 2: 67. *pl. 220, f. a.* 1799. *G. excelsa* Krause, Bot. Jahrb. 40: 327. 1908.

A tree 8–30 meters high, glabrous almost throughout; stipules broadly triangular, 8–12 mm. long; leaves short-petiolate, oblong to obovate, 10–35 cm. long, acute or acuminate, acute or attenuate at

the base; calyx 5–8 mm. long; corolla yellowish white, more or less sericeous, 2–4.5 cm. long; fruit brownish, 6–7.5 cm. in diameter.

Junín: La Merced, 1,000 meters, *Weberbauer 1901*, type of *G. excelsa*.—Loreto: Caballo-cocha on the Amazon, in forest, *Williams 2147*. Manfinfa, Alto Río Nanay, *Williams 1096*. La Victoria, on the Amazon, *Williams 2932*. Lower Río Nanay, *Williams 607*. Río Itaya, *Williams 142*. Puerto Arturo, Yurimaguas, *Williams 4998*. Sapote Yacu, Santa Rosa, in pasture, *Williams 4830*. Mishuyacu, *Klug 690*.—San Martín: Pampa Hermosa, *Ruiz & Pavón* (photo. of type of *G. oblongifolia*). San Roque, *Williams 7379*. Widely distributed in tropical America. Negs. 356, 357.

"Jagua," "vito," "yaku-huito," "vitu," "palo colorado. Known in Brazil by the names "jenipapa," "jenipabo," "jenipapo." The wood is strong, resistant, and flexible. Ruiz and Pavón report that it was employed in Peru for making various utensils, and it is a favorite wood for construction purposes in many parts of tropical America. The pulp of the fruit is edible, but not remarkably palatable. Its dark juice leaves an indelible stain upon every object that it touches. It formerly was much used by the aborigines for painting their bodies, yielding a dark blue or black color, and doubtless it still is employed in the same manner by the uncivilized Indians of the forests along the eastern slopes of the Andes.

So far as I am able to determine, neither *Genipa oblongifolia* nor *G. excelsa* differ in any respect from the typical form of *G. americana*. *Genipa Caruto*, of northern South America, with soft-pubescent leaves, is perhaps best regarded as a distinct species, although it differs little from *G. americana* except in its copious pubescence.

51. GARDENIA Ellis

Shrubs or small trees, usually unarmed; stipules acute or acuminate, triangular; leaves commonly opposite; flowers large, axillary and solitary or rarely terminal or corymbose; calyx tubular, spathaceous, or parted; corolla salverform or funnelform, with elongate tube, usually glabrous in the throat, the lobes 5–9; stamens inserted in the corolla throat, the anthers sessile or subsessile; ovary commonly 1-celled; fruit usually fleshy, baccate, the seeds numerous, horizontal.

Gardenia augusta (L.) Merr. Interp. Herb. Amboin. 485. 1917. *Varneria augusta* L. Amoen. 4: 136. 1759. *G. jasminoides* Ellis, Phil. Trans. 51, pt. 2: 935. 1761. *G. florida* L. Sp. Pl. ed. 2. 305. 1762.

A stout, densely branched shrub, the branchlets scaberulous-puberulent; stipules 1 cm. long; leaves short-petiolate, coriaceous, the blades obovate or oblong-obovate, 4–7.5 cm. long, obtuse or acute, narrowed to the base, almost glabrous; flowers white, large and showy, commonly double in the cultivated forms; calyx lobes foliaceous, triangular-lanceolate, 2–2.5 cm. long.

Loreto (cultivated): Paraíso, Alto Río Itaya, *Williams 3237*. Near Iquitos, *Williams 1509*. Native of southern China.

"Jazmín," "jazmín de cabo." The plant is cultivated generally in tropical regions for its handsome flowers.

52. DUROIA L. f.

Shrubs or trees, unarmed, with thick branchlets; stipules usually united and forming a cap at first, but soon circumscissile or otherwise deciduous; leaves opposite or verticillate, petiolate, chiefly coriaceous; inflorescence terminal; flowers dioecious, usually 6-parted, the staminate clustered or in cymes; calyx cupular or tubular, truncate or lobate; corolla salverform, the lobes contorted in bud; anthers sessile or subsessile at the middle of the corolla tube; pistillate flowers solitary or clustered, terminal; ovary usually 1-celled; fruit large, baccate; seeds rounded-trigonous, compressed, with fibrous-reticulate testa.

Young branches with large, hollow swellings. Leaves and fruit densely hirsute ..... *D. hirsuta.*

Young branches slender, not swollen.

Leaves glabrous or nearly so, not hirsute ..... *D. longifolia.*

Leaves copiously hirsute on one or both surfaces.

Leaf blades narrowly oblong or oblanceolate-oblong. *D. stenophylla.*

Leaf blades elliptic ..... *D. trichocarpa.*

Duroia hirsuta (P. & E.) Schum. in Mart. Fl. Bras. 6, pt. 6: 367. 1889. *Amaioua hirsuta* P. & E. Nov. Gen. & Sp. 3: 25. *pl. 230.* 1845.

A shrub or small tree 3–5 meters high, copiously hirsute throughout; lowest node of each branchlet elongate and fusiform, the upper ones abbreviated; stipules triangular-subulate; leaves short-petiolate, the blades rather thin, obovate to oblong, 10–20 cm. long, acuminate or cuspidate-acuminate, acute at the base; staminate

inflorescence head-like or cymose; calyx lobes linear and elongate; corolla 2.5 cm. long, white, sericeous outside, the lobes longer than the tube; pistillate flowers solitary, cream-colored; fruit ellipsoid, 2-celled, long-hirsute, about 3 cm. long.

Loreto: Forests of Río Nanay, *Williams 759*. San Antonio, Río Itaya, *Williams 3501*. Santa Rosa, in forest, 135 meters, *Killip & Smith 28947*. Mishuyacu, near Iquitos, 100 meters, *Klug 372*. Mouth of Río Santiago, upper Marañón, *Tessmann 4601*. Soledad, Río Itaya, 110 meters, dense forest, *Killip & Smith 29817*. Florida, 180 meters, *Klug 2289*.—Without locality: *Poeppig 2823*. Also in Amazonian Brazil and in Colombia.

"Supai-quinilla," "sacha-runa-caspi," "supai-caspi," "palo del diablo." The large, inflated nodes of the branches are inhabited by ants.

Duroia longifolia (P. & E.) Schum. in Mart. Fl. Bras. 6, pt. 6: 365. 1889. *Amaioua longifolia* P. & E. Nov. Gen. & Sp. 3: 26. 1845.

A shrub or small tree, the branchlets ferruginous-strigose or glabrate; stipules as much as 3.5 cm. long, lanceolate, acute; leaves short-petiolate, the blades narrowly oblong or oblanceolate-oblong, 10–25 cm. long, acuminate, acute or attenuate at the base, more or less strigose or almost glabrous; staminate inflorescence cymose; calyx lobes linear-subulate; corolla white, about 22 mm. long; pistillate flowers solitary, pedicellate; fruit globose, glabrous, 2 cm. in diameter. Neg. 336.

Loreto: Forest of Paraíso, Alto Río Itaya, *Williams 3373*. Río Masana, *Williams 162, 30*. Also along the upper Amazon in Brazil.

The vernacular name "gurupea" is reported from Brazil.

Duroia stenophylla Standl. Field Mus. Bot. 8: 353. 1931.

A shrub 2 meters high, the branchlets densely fulvous-hirsute; stipules oblong, 2–3 cm. long, obtuse; leaves short-petiolate, opposite, the blades about 17 cm. long, 4–5 cm. wide, caudate-acuminate; staminate inflorescence cymose, pedunculate, rather few-flowered, the flowers pedicellate; calyx lobes linear-subulate, 8 mm. long; corolla sericeous outside, greenish white, the tube 13 mm. long, the linear lobes 23 mm. long.

Loreto: Mishuyacu, near Iquitos, in forest, *Klug 699*, type.

Duroia trichocarpa Standl. Field Mus. Bot. 8: 353. 1931.

A medium-sized tree, the branchlets densely hirsute; leaves opposite, the blades 14–26 cm. long, 7–16 cm. wide, acute and cau-

date-acuminate, hirsute or glabrate above, sparsely hirsute beneath; pistillate flowers densely fasciculate, sessile or subsessile; calyx densely rusty-hirsute, the lobes linear; fruit obovoid-globose, 3 cm. long, densely brown-hirsute.

Loreto: San Antonio, Alto Río Itaya, in forest, *Williams 3470*, type.

53. AMAIOUA Aubl.

Unarmed shrubs or small trees; stipules connate, becoming cleft on one side or irregularly ruptured, finally circumscissile at the base; leaves more or less coriaceous, petiolate, opposite, or ternate; flowers usually 6-parted, dioecious; calyx tubular, the teeth short or elongate; corolla salverform, the lobes equaling or shorter than the tube, oblique, contorted in bud, sericeous outside, the tube constricted at the throat, pubescent within near the base; stamens inserted in the lower part of the tube, the anthers linear, dorsifixed below the middle; fruit baccate, 2-celled; seeds numerous, horizontal, rounded-trigonous.

Young branches with short, spreading hairs, becoming glabrate; corolla 4–5 cm. long.....*A. urophylla.*

Young branches sericeous; corolla usually 1.5–2 cm. long.

Lobes of the staminate corolla equaling the tube; leaf blades mostly oblong to oblong-lanceolate.....*A. guianensis.*

Lobes of the staminate corolla much shorter than the tube; leaf blades usually broadly elliptic.....*A. corymbosa.*

Amaioua corymbosa HBK. Nov. Gen. & Sp. 3: 419. *pl. 294.* 1819. (?)*A. peruviana* Desf. Mém. Mus. Paris 6: 16. *pl. 4, f. B.* 1820.

A shrub or small tree; stipules oblong, acute, 1.5 cm. long, sericeous outside; leaves short-petiolate, the blades 6–12.5 cm. long, shortly obtuse-acuminate, short-acuminate at the base, glabrous above, appressed-pilose beneath along the veins or glabrate; staminate inflorescence corymbose, several-flowered; calyx lobes short or minute; corolla 18–20 mm. long, the lobes narrowly lanceolate, subfalcate; pistillate inflorescence capitate, several-flowered, short-pedunculate, the corolla about 1 cm. long; fruit ellipsoid, glabrate. Neg. 339.

Ranging from Bolivia to the Guianas, Cuba, and Panama. *A. peruviana* was based upon a specimen believed to have been collected in Peru. It is referred doubtfully to the synonymy of *A. corymbosa* by Schumann, in Mart. Fl. Bras. 6, pt. 6: 360. 1889. It is uncertain,

of course, whether the reference is correct, and *A. corymbosa* may not occur in Peru.

Amaioua guianensis Aubl. Pl. Guian. Suppl. 13. *pl. 375.* 1775.

A shrub or tree 2.5–6 meters high; stipules commonly 8–12 mm. long, sericeous outside; leaves short-petiolate, subcoriaceous, the blades 10–20 cm. long, abruptly short-acuminate, acute to attenuate at the base, glabrous above, beneath appressed-pilose or glabrate; staminate inflorescence corymbose, several-flowered, the flowers short-pedicellate; calyx lobes linear-lanceolate; corolla white, about 17 mm. long, the lobes acute, lanceolate; pistillate inflorescence capitate, sessile, usually 5–6-flowered; fruit oblong or ellipsoid, 15–17 mm. long, glabrate, yellowish to deep purple.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 852.* Balsapuerto, in dense forest, *Killip & Smith 28393.* Ranging to Brazil and the Guianas.

The fruits are said to be edible.

Amaioua urophylla Standl. Field Mus. Bot. 8: 354. 1931.

A tree 6 meters high; stipules ovate-triangular, 8–12 mm. long; leaves short-petiolate, coriaceous, the blades oblong-elliptic, 10–20 cm. long, caudate-acuminate, acute to rounded at the base, glabrous above, puberulent beneath and appressed-pilose on the veins; staminate inflorescence pedunculate, many-flowered, dense, the flowers sessile or subsessile; calyx teeth short, triangular; corolla white, densely sericeous outside, the lobes linear-oblong-attenuate.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 419*, type.

54. ALIBERTIA A. Rich.

Shrubs or small trees, glabrous or pubescent; stipules distinct; flowers dioecious, small or medium-sized, the staminate fasciculate or capitate, the pistillate usually solitary, 4–10-parted; staminate flowers 4–5-parted, the calyx campanulate or tubular, truncate or dentate, the corolla salverform, the lobes contorted in bud, usually more or less oblique, the tube glabrous or puberulent in the throat; stamens inserted on the corolla tube, the filaments short; fruit baccate, globose, 2–5-celled, with fleshy pulp; seeds subcompressed, suborbicular, with subfibrous testa.

Leaves densely pilose beneath. Corolla of staminate flower about 22 mm. long ..... *A. claviflora.*

Leaves glabrous.

Corolla of staminate flower about 15 mm. long; calyx with conspicuous, subulate teeth. Corolla lobes acuminate. *A. stenantha.*

Corolla 20–25 mm. long; calyx truncate or with minute teeth.

Corolla straight in bud, the lobes acuminate, about equaling the tube; calyx several times as long as the disk...*A. edulis.*

Corolla curved in bud, the lobes obtuse, shorter than the tube; calyx little longer than the disk.....*A. curviflora.*

Alibertia claviflora Schum. in Mart. Fl. Bras. 6, pt. 6: 387. 1889. *Cordiera claviflora* Kuntze, Rev. Gen. 1: 279. 1891.

Stipules ovate-oblong, acuminate, 17–20 mm. long; petioles 8–20 mm. long; leaf blades oblong or oblong-lanceolate, 12–30 cm. long, acuminate or cuspidate, subcoriaceous, glabrous above, soft-pubescent beneath; staminate flowers terminal, about 8-fasciculate; calyx short-pilose outside; corolla sparsely appressed-pilose outside, the lobes acuminate, about equaling the tube. Neg. 22780.

San Martín: Near Tarapoto, *Spruce 4477*, type collection.

Alibertia curviflora Schum. in Mart. Fl. Bras. 6, pt. 6: 387. 1889. *Cordiera curviflora* Kuntze, Rev. Gen. Pl. 1: 279. 1891.

Stipules ovate-triangular, 7 mm. long; leaves petiolate, the blade oblong, 12–19 cm. long, shortly obtuse-acuminate, at the base rounded and decurrent, herbaceous; staminate inflorescence about 10-flowered, subtended by 2 large, foliaceous bracts; calyx glabrous; corolla minutely puberulent. Neg. 22781.

San Martín: Type collected along the Río Mayo near Tarapoto, *Spruce 4806*. Amazonian Brazil.

Alibertia edulis (L. Rich.) A. Rich. ex DC. Prodr. 4: 443. 1830. *Genipa edulis* L. Rich. Act. Soc. Hist. Nat. Paris 1: 107. 1792. *Cordiera edulis* Kuntze, Rev. Gen. 1: 279. 1891.

A glabrous shrub or small tree; stipules triangular, acute or acuminate, 6–10 mm. long; leaves short-petiolate, subcoriaceous, the blades lance-oblong to oval-ovate, 6–20 cm. long, usually short-acuminate, acute to rounded at the base; staminate flowers usually 6–8, terminal, sessile; corolla white, sparsely or densely sericeous outside; fruit globose, green or yellowish, about 2.5 cm. in diameter, containing numerous large seeds.

Loreto: Iquitos, *Williams 8061*. La Victoria, on the Amazon, in forest, *Williams 2921*.—San Martín: Juan Guerra, in forest, *Williams 6869*. Tarapoto, 750 meters, *Williams 6112*. Ranging to Brazil and northward to Mexico. Called "puruí" in Brazil.

All the specimens cited above are in fruit only, and their determination is open to question.

Alibertia stenantha Standl. Field Mus. Bot. 8: 170. 1930.

A glabrous shrub; stipules lance-triangular, 7–8 mm. long; leaves short-petiolate, membranaceous, the blades oblong-elliptic or elliptic, 15–20 cm. long, abruptly caudate-acuminate, acute at the base or sometimes rounded and decurrent, minutely barbate beneath in the axils of the nerves; staminate inflorescence terminal, sessile, many-flowered, the flowers short-pedicellate; calyx minutely puberulent or almost glabrous; corolla glabrous outside, densely barbate in the throat; pistillate flowers terminal, solitary; fruit globose, 1.5–2 cm. in diameter.

Loreto: La Victoria, on the Amazon, *Williams 3117* (type), *2941*, *3116*, *2833*, *2848*. San Antonio, on Río Itaya, 110 meters, *Killip & Smith 29481*. Leticia, on the Amazon, in forest, *Williams 3154*, *3163*, *3168*. Iquitos, *Williams 8046*. Caballo-cocha, in forest, *Williams 2225*. Santa Rosa, 135 meters, in forest, *Killip & Smith 28831*. Amazonian Brazil.

The corollas are described as either yellow or white.

55. RETINIPHYLLUM Humb. & Bonpl.

Shrubs or small trees, the branches often exuding resin; stipules persistent, united into a subentire or lobate sheath; leaves opposite, short-petiolate, coriaceous; inflorescences axillary or terminal, spike-like or raceme-like, the flowers sessile or pedicellate, calyculate by 2 bractlets; calyx usually 5-lobate; corolla tubular-salverform, the throat naked, the lobes contorted-imbricate; ovary several-celled, the cells 2-ovulate; fruit fleshy, striate, subglobose, containing 5 nutlets.

Leaves pilose beneath; pedicels 1 cm. long.....*R. fuchsioides.*
Leaves glabrous; pedicels much shorter.....*R. angustiflorum.*

Retiniphyllum angustiflorum Krause, Bot. Jahrb. 40: 326. 1908.

A shrub 2–3 meters high; leaves short-petiolate, glabrous, the blades oblong or elliptic-oblong, long-acuminate, acute at the base,

8–18 cm. long; racemes terminal, pedunculate, with numerous rather evenly distributed flowers; calyx 5-dentate; corolla white, minutely puberulent or glabrate, the tube 2 cm. long, the spreading lobes half as long; fruit ovoid, red, 4–6 mm. long. Neg. 289.

Loreto: Near Rioja, 800–900 meters, *Weberbauer 4695*, type (photo. and fragm. seen, ex hb. Berol.). Mishuyacu, near Iquitos, in forest, 100 meters, *Klug 133*.

Retiniphyllum fuchsioides Krause, Verh. Bot. Ver. Brandenb. 50: 101. 1908.

Said to be a scandent shrub; stipule tube 8–12 mm. long; leaf blades oblong or elliptic-oblong, short-acuminate, acute at the base, sparsely appressed-pilose above, more densely so beneath; racemes long-pedunculate, longer than the leaves, rather evenly many-flowered; calyx lobes triangular, acute; corolla red, glabrate, the tube 2 cm. long; fruit globose, 6–8 mm. in diameter. Neg. 288.

Loreto: Cerro de Escalera, 1,100 meters, *Ule 6544*, type (photo. and fragm. seen, ex hb. Berol.).

56. MACHAONIA Humb. & Bonpl.

Shrubs or small trees, often armed with spines; stipules small, triangular; leaves opposite; flowers small, 4–5-parted, arranged in terminal panicles or umbelliform cymes; sepals equal or unequal, persistent; corolla short-funnelform, villous in the throat, the lobes imbricate; stamens inserted in the corolla throat, the filaments short or elongate, the anthers oblong, versatile; fruit dry, laterally compressed, separating into 2 indehiscent, 1-seeded carpels.

Sepals narrowly lanceolate; leaves glabrate beneath . . *M. peruviana.*

Sepals broadly ovate or rounded, obtuse or rounded at the apex; leaves densely velvety-pilosulous beneath . . . . . *M. Williamsii.*

Machaonia peruviana Wernham, Journ. Bot. 51: 220. 1913.

A shrub with glabrous branches; leaf blades acuminate, hirtellous above, glabrate beneath; flowers in lax, few-flowered panicles; corolla 2.5 mm. long, glabrous outside.

Type said to have been collected in Peru by Pavón; it may have come from Ecuador. Known to the writer only from description.

Machaonia Williamsii Standl. Field Mus. Bot. 8: 357. 1931.

A shrub or small tree, the branchlets densely velutinous-pilosulous; stipules 2.5–3.5 mm. long; leaves petiolate, membranaceous,

the blades oblong-elliptic or ovate-elliptic, 5–9.5 cm. long, acuminate, acute or subobtuse at the base; inflorescence dense and many-flowered, 2.5–10.5 cm. long; corolla glabrous outside, 2.5–3 mm. long; fruit cuneate-obovate, 3 mm. long, puberulent.

San Martín: Juan Guerra, near Tarapoto, *Williams 6886*, type. Río Mayo, Tarapoto, in forest, *Williams 6255, 6248, 6246, 6256*.

57. GUETTARDA L.

Shrubs or small trees, sometimes armed with spines; leaves opposite or ternate, usually coriaceous; inflorescences axillary, frequently dichotomous and with secund flowers; calyx tubular, truncate, persistent; corolla salverform, the lobes imbricate in bud; anthers subsessile, included; ovary 2–9-celled; fruit drupaceous, the endocarp woody or bone-like, surrounded by scant pulp or often almost dry.

Fruit terete, not angled; inflorescence cymose or head-like, not conspicuously dichotomous.

Pubescence of the lower leaf surface of spreading or at least not closely appressed hairs; plants sometimes armed with spines.

Branches hirsute with long, spreading hairs, unarmed. *G. comata.*

Branches not hirsute or, if so, the hairs very short, armed with spines.

Spines recurved; leaves short-petiolate..... *G. ferox.*

Spines straight; leaves on elongate petioles.... *G. boliviana.*

Pubescence of the lower leaf surface of closely appressed hairs; plants unarmed.

Branches of the inflorescence elongate and recurved, the flowers conspicuously secund; leaf blades acute at the base. *G. Ulei.*

Branches of the inflorescence short, erect, the flowers not evidently secund; leaf blades obtuse to subcordate at the base. *G. aromatica.*

Fruit angled; inflorescence once furcate, with simple branches.

Pubescence of the lower leaf surface closely appressed. *G. ochreata.*

Pubescence of the lower leaf surface of long, loosely matted hairs.

Fruit 5-celled..... *G. hirsuta.*

Fruit 2–3-celled..... *G. dependens.*

Guettarda aromatica P. & E. Nov. Gen. & Sp. 3: 27. *pl. 232.* 1845. *G. nitida* Krause, Verh. Bot. Ver. Brandenb. 50: 107. 1908.

A rather slender shrub 2–4 meters high; petioles short or elongate; leaf blades oblong to oblong-elliptic or even broader, mostly 10–18 cm. long, obtuse to short-acuminate, rather thin, glabrate above, thinly sericeous beneath; peduncles equaling or shorter than the leaves, the cymes dense and often head-like, few- or many-flowered; ovary usually 4-celled; corolla white, densely sericeous, the slender tube 20–23 mm. long, the 5 lobes obtuse, 2–4 mm. long. Neg. 389.

Huánuco: Casapí, *Mathews 1944*.—Loreto: Santa Rosa, in forest, *Williams 4791*. Florida, Río Putumayo, 325 meters, *Klug 2051*. Type of *G. aromatica* from Río Huallaga (perhaps in San Martín), *Poeppig*.—San Martín: Tarapoto, *Ule 6648*, type of *G. nitida* (photo. and fragm. seen, ex hb. Berol.). Tarapoto, *Williams 6627; Spruce 4508*. Amazonian Brazil.

I have seen no authentic material of *G. aromatica*, but the original description and illustration agree well with the material cited above, and with the type of *G. nitida*.

Guettarda boliviana Standl. Field Mus. Bot. 4: 289. 1929.

A shrub or small tree 3–5.5 meters high; leaves on short or elongate petioles, the blades oblong-elliptic to broadly elliptic, 6–13 cm. long, acute or abruptly acuminate, sparsely appressed-pilose above, pilose beneath with chiefly spreading or at least not closely appressed, brownish hairs; cymes at first dense, in fruit more open, many-flowered, long-pedunculate, often much exceeding the leaves; calyx 1.5–2 mm. long; corolla densely grayish-sericeous, the tube almost 2 cm. long, the lobes 6 mm. long; fruit broadly ellipsoid or subglobose, purple, 1–1.4 cm. long, 4-celled.

Junín: La Merced, 700 meters, *Killip & Smith 23775*. San Ramón, 900–1,300 meters, open hillside, *Killip & Smith 24783*. Also in eastern Bolivia.

There is a possibility that the Peruvian plant may be specifically distinct from the Bolivian, since its flowers are not known.

Guettarda comata Standl., sp. nov.

Arbor 5-metralis, ramulis cinnamomeis pilis longis patentibus brunnescentibus longihirsutis, internodiis brevibus vel elongatis; stipulae 8 mm. longae deciduae brunneae cuspidatae costatae, extus ad costam dense hirsutae; folia mediocria petiolata firme membranacea, petiolo gracili 1–1.5 cm. longo hirsuto; lamina

oblongo-obovata vel lanceolato-ovata 10–12.5 cm. longa 4–5.5 cm. lata longe anguste acuminata vel interdum abrupte cuspidato-acuminata, prope basin paullo angustata, basi ipsa rotundata vel subcordata, supra in sicco brunnescens sparse hirtella, costa venisque prominentibus, sublucida, subtus breviter hirsuta et strigosa, costa gracili elevata, nervis lateralibus utroque latere circa 13 prominentibus obliquis, venulis transversis prominulis laxe reticulatis inconspicuis; inflorescentiae axillares subcapitatae dense pauciflorae, pedunculo gracili 4–9 cm. longo hirsuto, bracteis conspicuis brunneis ovatis vel lanceolatis ad 2 cm. longis hirsutis et longiciliatis; hypanthium vix 1 mm. longum hirsutum; calyx anguste campanulatus 5 mm. longus truncatus minute tomentulosus et adpresso-hirsutus; corolla ochroleuca extus dense pilis longis ochraceis sericea, tubo crassiusculo 18 mm. longo superne paullo dilatato, lobis 6 late oblongis vel ovalibus 5 mm. longis.

Loreto: Fortaleza, near Yurimaguas, 140 meters, in forest, *Klug 2805* (herb. Field Mus. No. 675,994, type).

Guettarda dependens (R. & P.) DC. Prodr. 4: 458. 1830. *Laugeria dependens* R. & P. Fl. 2: 23. *pl. 145, f. b.* 1799. *G. crispiflora* var. *dependens* Pers. Syn. Pl. 2: 201. 1805.

A tree about 10 meters high with grayish trunk; branchlets ferruginous, pubescent; stipules half as long as the petioles, ovate-lanceolate, acute, deciduous; petioles 1.5–2 cm. long; leaf blades elliptic-ovate, abruptly acuminate, obtuse at the base and abruptly contracted, veiny, somewhat shining above, rusty-tomentose beneath; peduncles equaling or longer than the petioles, the 2 branches short, few-flowered; corolla tomentose outside, 13 mm. long or more, the tube purplish, the lobes white, crispate; drupes small, oblong, 3-celled, rarely 2- or 4-celled. Neg. 395.

Huánuco: Type from Muña, *Ruiz & Pavón.*

I have seen a photograph (ex hb. Berol.) of presumably type material of this species, and so far as may be judged from the photograph, the plant is not specifically distinct from *G. hirsuta.* The original description and illustration agree well with material of *G. hirsuta,* except in the number of cells in the fruit and ovary, and that may well be a variable character.

Guettarda ferox Standl. Field Mus. Bot. 8: 171. 1930.

Probably scandent, the stout spines abruptly recurved, 2–3 cm. long; branchlets velvety-pilose; stipules 8 mm. long, acuminate, deciduous; petiole stout, 6–10 mm. long; leaf blades oblong or

elliptic-oblong, 10–15 cm. long, abruptly short-acuminate, obtuse or narrowly rounded at the base, glabrate above, densely soft-pilose beneath; cymes subcapitate or short-furcate, densely few-flowered, much shorter than the blades, the peduncles 1.5–2 cm. long; fruit oval, 15–18 mm. long, densely brown-tomentose, 4-celled. "Garrabato."

Loreto: Pinto Cocha, on the Río Nanay, in forest, *Williams 808*, type.

Guettarda hirsuta (R. & P.) Pers. Syn. Pl. 1: 200. 1805. *Laugeria hirsuta* R. & P. Fl. 2: 22. *pl. 145, f. a.* 1799. *Cordia Poeppigii* DC. Prodr. 9: 492. 1845. *C. tarmensis* Krause, Bot. Jahrb. 37: 630. 1906. *Tournefortiopsis major* Wernham, Journ. Bot. 53: 15. 1915.

A shrub or tree as much as 15 meters high, with densely rusty-tomentose branches; petioles short or much elongate; leaf blades elliptic to elliptic-oblong, mostly 10–20 cm. long but sometimes much larger, abruptly acute or acuminate, acute to attenuate at the base, glabrate above, more or less lustrous and reticulate, beneath densely tomentose; peduncles longer or shorter than the petioles, the branches short or elongate, many-flowered; corolla white, 1 cm. long or more; fruit ovoid or ellipsoid, about 7 mm. long, densely tomentose. Neg. 396.

Cajamarca: Cutervo, *Raimondi 4472, 4776*.—Huánuco: Chinchao, *Ruiz* (photo. ex hb. Berol., probably type material). Described from Cochero and Chinchao, *Ruiz & Pavón*. Puyash, *Sawada 94*.—Junín: Huacapistana, *Weberbauer 2045* (type of *Cordia tarmensis*). Chanchamayo Valley, 1,200 meters, *Schunke 287*. Above San Ramón, 1,300–1,700 meters, *Schunke A28*.—Libertad: Prov. Pataz, *Weberbauer 7065*. Huayo, *Raimondi*.—San Martín: Zepelacio, 1,100 meters, in forest, *Klug 3660*.—Without locality: *Pavón 457; Mathews 1938*. Also in Ecuador.

Tournefortiopsis major was based upon *Poeppig 1300*, from Peru or Brazil, but doubtless from Peru, since the plant is a mountain species, which scarcely would be expected anywhere along the Brazilian Amazon. *Cordia Poeppigii* (of which I have seen a fragment) was collected in subandine Peru by Poeppig.

Guettarda ochreata Schlecht. Linnaea 28: 496. 1856. *G. pichisensis* Standl. Field Mus. Bot. 8: 172. 1930.

A shrub 3–3.5 meters high, the branchlets griseous-sericeous; stipules brownish, deciduous, 1.5–2 cm. long, acute; leaves long-

petiolate, the blades thin, ovate to lance-oblong, 16–25 cm. long, long-acuminate, attenuate to the base, sericeous above or glabrate; cymes much shorter than the petioles, the peduncles 7–12 mm. long, the branches 1–2 cm. long, 5–7-flowered; fruit 5–6 mm. long, minutely sericeous, 4–celled. Neg. 25659.

Junín: Between San Nicolás and Azupizú, 650–900 meters, dense forest, *Killip & Smith 26104*, type of *G. pichisensis*.—Puno: Sangabán, *Lechler 2407*, type.

G. pichisensis was described as new before the writer had seen authentic material of *G. ochreata*, with access only to its description, which is inaccurate and misleading in several details. Examination of a photograph and a fragment of an authentic specimen of *G. ochreata* leaves little if any doubt that it is identical with *G. pichisensis*.

Guettarda Ulei Krause, Notizbl. Bot. Gart. Berlin 6: 203. 1914.

A tree 6–18 meters high; leaves short-petiolate, the blades ovate-elliptic or ovate-oblong, 3–5 cm. long, obtuse to acuminate, 2–3 cm. wide, pilose beneath, especially on the veins; peduncles slender, equaling or shorter than the leaves, the cymes with few slender, elongate, many-flowered, recurved branches; corolla white, the slender tube 16–18 mm. long. Neg. 388.

Madre de Dios: Seringal Auristella, Alto Río Acre, *Ule 9860*, type (photo. and fragm. seen, ex hb. Berol.). Also in adjacent Brazil.

58. MALANEA Aubl.

Shrubs or small trees, often more or less scandent; leaves opposite, short-petiolate; flowers small, 4-parted, arranged in axillary panicles with spike-like branches; calyx short-tubular, truncate or dentate; corolla subcampanulate, the lobes valvate or nearly so; stamens inserted in the corolla throat, short-exserted; ovary 2-celled, the cells 1-ovulate; fruit drupaceous, the endocarp woody or bony, 2-celled or by abortion 1-celled.

Malanea boliviana Standl. Field Mus. Bot. 7: 295. 1931.

A woody vine, the branchlets densely strigillose; stipules deciduous, ovate-oblong, acuminate, 8 mm. long; leaf blades coriaceous, elliptic-oblong, 5–7.5 cm. long, acuminate, acute or obtuse at the base, sparsely strigose above at first but soon glabrate, sparsely strigose beneath; inflorescences longer than the leaves, simple or sparsely branched; calyx obscurely dentate; corolla strigose, ochroleucous, the tube 2.5 mm. long, the obtuse lobes somewhat shorter.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 917*. Iquitos, in forest, *Kuhlmann 22937*. Also in Bolivia.

59. CHOMELIA Jacq.

Shrubs or small trees, often armed with spines; stipules interpetiolar, usually persistent; leaves opposite, petiolate; flowers in axillary cymes, sessile; calyx 4-lobate; corolla salverform, the lobes valvate or slightly imbricate, usually much shorter than the tube, bearing near the apex a dorsal, horn-like appendage; anthers subsessile; fruit drupaceous, the large, bony stone 2-celled.

Leaves subcoriaceous, 8–19 cm. long; stipules 6–7 mm. long. *C. unguis-cati.*

Leaves firm-membranaceous, 3–5 cm. long; stipules 2.5–3 mm. long. *C. barbellata.*

Chomelia barbellata Standl., sp. nov.

Arbor 5-metralis, ramulis rigidis ochraceis primo sparse incurvo-pilosulis spinis pallidis gracilibus rigidis ad 15 mm. longis armatis, ramulis floriferis abbreviatis et dense foliatis; stipulae anguste triangulari-subulatae 2.5–3 mm. longae persistentes; folia parva firme membranacea breviter petiolata in sicco fusca, petiolo gracili pilosulo ad 5 mm. longo; lamina elliptica vel ovato-elliptica 3–5 cm. longa 1.5–2.5 cm. lata acuminata basi acuta vel acuminata, supra ad venas hinc inde pilosula vel fere glabra, subtus ad nervos strigosa, in axillis nervorum dense barbellata, nervis lateralibus utroque latere 4–6 obliquis valde arcuatis prominulis, nervulis obscuris; flores axillares solitarii vel fasciculati sessiles; calyx cum hypanthio tubuloso-campanulatus 2.5 mm. longus extus dense minute strigillosus, lobis linearibus 1–1.5 mm. longis; corolla alba extus dense ochraceo-strigosa, tubo gracillimo 8–9 mm. longo, lobis apice vix brevissime appendiculatis anguste oblongis intus glabris apiculatis 4–5 mm. longis patentibus.

San Martín: Juan Jui, Alto Río Huallaga, 400 meters, in forest, *Klug 3920* (herb. Field Mus. No. 766,412, type).

Chomelia unguis-cati Standl. Field Mus. Bot. 8: 172. 1930.

Branches armed with stout spines, young branchlets appressed-pilose; stipules triangular, 6–7 mm. long; leaves short-petiolate, the blades subcoriaceous, ovate-oblong, 8–19 cm. long, acute or acuminate, glabrous and shining above, strigose beneath on the veins; inflorescence long-pedunculate, head-like, few-flowered; drupes

narrowly oblong, 17–22 mm. long, 6 mm. thick, appressed-pilose. "Garras de gato," "anzuelo casha."

Loreto: Timbuchi, on the Río Nanay, *Williams 991*, type. Also in eastern Bolivia.

60. ANISOMERIS Presl

Shrubs or small trees, unarmed or often with spinose branchlets; stipules small, usually persistent; leaves petiolate, membranaceous or subcoriaceous; inflorescences axillary, cymose and pedunculate or sometimes reduced to a single flower; calyx 4-lobate or 4-parted; corolla salverform, the lobes imbricate or subvalvate, naked dorsally, the tube usually slender and elongate; fruit drupaceous, 1–2-seeded, the ovary 2-celled.

Inflorescences cymose, pedunculate.

Leaves glabrous beneath or nearly so, barbate in the axils of the veins; calyx lobes minute; corolla lobes very obtuse. *A. peruviana.*

Leaves sericeous beneath, not barbate; calyx lobes elongate; corolla lobes acute or acutish..... *A. paniculata.*

Inflorescence sessile or nearly so, sometimes reduced to a single flower.

Leaves sericeous or glabrate beneath; flowers solitary or few and fasciculate..... *A. Klugii.*

Leaves pilose beneath with short, spreading hairs; flowers in dense, sessile clusters..... *A. sessilis.*

Anisomeris Klugii Standl. Field Mus. Bot. 8: 360. 1931.

A slender shrub 2 meters high; stipules narrowly triangular to linear-subulate, 2.5–3.5 mm. long; leaves short-petiolate, the blades oblong-ovate to lance-elliptic, 4–7 cm. long, caudate-acuminate, acute at the base; flowers sessile or short-pedicellate; calyx sericeous, the lobes linear, 2–2.5 mm. long; corolla white, densely sericeous outside, the slender tube 18 mm. long, the 4 lobes linear-attenuate, 4 mm. long.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 661*, type. Santa Rosa, 135 meters, in forest, *Killip & Smith 28738*.

The determination of the latter specimen is somewhat uncertain. It is from a shrub whose branches are armed with spines in their axils.

Anisomeris paniculata (Bartl.) Standl. Field Mus. Bot. 4: 293. 1929. *Guettarda paniculata* Bartl. ex DC. Prodr. 4: 457. 1830. *Stenostomum paniculatum* P. & E. Nov. Gen. & Sp. 3: 27. *pl. 232, f. a-e.* 1845.

A shrub or small tree, said to be as much as 15 meters high, sometimes armed with spines, the young branches densely appressed-pilose; leaves short-petiolate, thick-membranaceous, elliptic to lance-oblong, 6–11 cm. long, acuminate or attenuate, acute or obtuse at the base, glabrous or glabrate above, sericeous or glabrate beneath; cymes dichotomous, usually long-pedunculate, many-flowered and rather lax; calyx lobes linear or subulate; corolla white, sericeous outside, 12–18 mm. long; fruit oblong, glabrate, about 8 mm. long. "Ripari," "cunshi-cashan," "cunshu-huacran."

Department unknown: Type collected somewhere in the mountains of Peru by *Haenke.* Without locality, *Mathews 1944; Poeppig Add. 13.*—Loreto: San Antonio, Alto Río Itaya, *Williams 3503.*—San Martín: Near Tarapoto, *Spruce 4208.* San Roque, in forest, *Williams 7142.* Tarapoto, *Williams 5617.* Mainas Alto, *Poeppig 1037.* Zepelacio, 1,200 meters, in clearing, *Klug 3372.* Pongo de Cainarachi, 230 meters, in forest, *Klug 2762.*

Anisomeris peruviana Standl. Field Mus. Bot. 4: 329. 1929.

Branchlets appressed-pilosulous or almost glabrous; stipules 1.5–2 mm. long, deltoid; leaves short-petiolate, subcoriaceous, the blades elliptic or oblong-elliptic, 2–7 cm. long, obtuse or acutish, acute at the base, glabrous above; peduncles 1–2 cm. long, the cymes densely few-flowered, the flowers sessile or short-pedicellate; corolla 18 mm. long, the slender tube glabrous below, the lobes oval-oblong, 2–2.5 mm. long, densely strigillose outside.

San Martín: Ucayali Valley, *Tessmann 3481,* type. Yarina-cocha, 150 meters, *Tessmann 3461.*

Anisomeris sessilis (Muell. Arg.) Standl. Field Mus. Bot. 8: 361. 1931. *Chomelia sessilis* Muell. Arg. Flora 58: 451. 1875.

A shrub 1.5–2.5 meters high, unarmed, the branchlets hispidulous; stipules 2 mm. long; leaves subsessile, the blades broadly ovate or elliptic, 2–3 cm. long, obtuse or acutish, rounded or obtuse at the base, puberulent above on the veins or glabrate, densely short-pilose beneath; cymes dense and several- or many-flowered; calyx lobes lance-spatulate to obovate-spatulate; corolla 12 mm. long, hirtellous; hypanthium hispidulous.

Loreto: Seringal Auristella, Río Acre, *Ule 9860.* Also in Brazil.

61. CHIOCOCCA L.

Shrubs with small, opposite, leathery leaves; stipules small, persistent; flowers small, pedicellate, more or less secund, arranged in axillary racemes or panicles; calyx 5-dentate; corolla funnelform, the lobes valvate or slightly imbricate in bud; stamens epigynous, the filaments free from the corolla or united with it only at the base; fruit 2-celled, somewhat fleshy, laterally compressed and disk-like; seeds 1 in each cell, compressed.

Chiococca alba (L.) Hitchc. Rept. Mo. Bot. Gard. 4: 94. 1893. *Lonicera alba* L. Sp. Pl. 175. 1753. *C. racemosa* L. Syst. Nat. ed. 10. 917. 1759. *C. brachiata* R. & P. Fl. 2: 67. *pl. 219.* 1799. *C. anguifuga* Mart. Spec. Mat. Med. Bras. 17. *pl. 5.* 1824. *C. brachiata* var. *grandifolia* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 50. 1881.

A slender, glabrous shrub 1–4.5 meters high, the branches often elongate and subscandent or pendent; leaves short-petiolate, the blades ovate or oblong-ovate, mostly 4–8 cm. long, acute or acuminate, acute or obtuse at the base; inflorescences usually of small, lax panicles; corolla 7–10 mm. long, white or yellowish, sometimes tinged with pink, the lobes very short; fruit white, orbicular, 5–7 mm. broad.

Amazonas: Chachapoyas, *Lobb.*—Ayacucho: Near Kimpitiriki, 400 meters, edge of forest, *Killip & Smith 22943, 23016.* Estrella, 500 meters, thickets, *Killip & Smith 23086.*—Huánuco: Type of *C. brachiata* from Chinchao, *Ruiz & Pavón.*—Junín: Chanchamayo Valley, *Schunke 351.* Eneñas, 1,600–1,900 meters, *Killip & Smith 25754.* Colonia Perené, 600 meters, *Killip & Smith 25029, 25146.* Huacapistana, 2,000 meters, thickets, *Killip & Smith 24142.*—Loreto: Puerto Arturo, Yurimaguas, 200 meters, *Williams 5214.* Between Yurimaguas and Balsapuerto, 150 meters, *Killip & Smith 28361.* Puerto Arturo, *Killip & Smith 27722.*—San Martín: Tarapoto, *Williams 5519, 5521, 5616, 6534.* Zepelacio, 1,200 meters, *Klug 3340.* San Roque, 1,400 meters, in forest, *Williams 7788.* Río Mayo, Tarapoto, in forest, *Williams 6217.* Alto Río Huallaga, *Williams 6167.*—Department unknown: Without locality, *Weberbauer 6018.* Forests of the Andes, *Ruiz.* Widely distributed in tropical America, ranging to Florida.

Known in Brazil by the names "cepocruz," "raiz preta," "caninarca," "cainca," and "caringa." The plant is used in some regions in domestic medicine, especially as a remedy for snake bites. The pearl-white, pendent fruits are rather pretty and ornamental, sug-

gesting the names "lágrimas de María" and "lágrimas de San Pedro" which are applied to the shrub in Central America.

62. COFFEA L.

Shrubs or small trees, usually glabrous throughout; stipules triangular, persistent; leaves short-petiolate, usually opposite; flowers sessile in the leaf axils, 4–5-parted; calyx very short; corolla salverform or funnelform, the lobes dextrorsely contorted in bud; anthers subsessile, dorsifixed; fruit fleshy, indehiscent, 2-seeded; seeds semi-oval, flat and deeply furrowed on the inner face.—No species of the genus are native in America.

Coffea arabica L. Sp. Pl. 172. 1753.

A shrub or small tree, densely branched; stipules 4–5 mm. long; leaves short-petiolate, the blades lance-elliptic, 12–16 cm. long, cuspidate-acuminate, acute at the base, subcoriaceous; flowers in clusters of 3–7 in the leaf axils, sessile; calyx annuliform, almost obsolete; corolla white, 17–19 mm. long, the 5 lobes widely spreading; fruit subglobose, red at maturity, 10–16 mm. in diameter. "Café."

Ayacucho: Aina, 750–1,000 meters, *Killip & Smith 22823*.—Huánuco: Posuso, 600 meters, well established along many trails, *4628*.—Junín: Colonia Perené, 600 meters, *Killip & Smith 25235*.—Loreto: Mishuyacu, *Klug 584*. La Victoria, *Williams 2736*. Caballococha, *Williams 2258*. Pisco, Alto Nanay, *Williams 1294*. Pro, on the Amazon, *Williams 1966*. Ica, Río Itaya, *Williams*. Fortaleza, Yurimaguas, *Williams 4222, 4467*.—San Martín: Tarapoto, 750 meters, *Williams 6099*. San Roque, 1,400 meters, *Williams 7063*. Native of Abyssinia, but cultivated in most tropical and subtropical regions.

Coffee is grown extensively in Peru at suitable elevations. As in all regions where the plant is grown, it sometimes escapes to thickets and forests and tends to establish itself. A coffee plantation in full flower is a beautiful sight. All the bushes come into blossom at once, but unfortunately the flowers last only two or three days.

Coffea longifolia R. & P. Fl. 2: 66. *pl. 218, f. a*. 1799.

A small, glabrous shrub; stipules ovate, connate; leaves opposite, petiolate, the blades lance-oblong, acuminate, acute at the base, undulate, shining above, almost 30 cm. long; flowers short-pedicellate, crowded, paniculate, the panicle sessile; calyx minutely 5-dentate; corolla white, 8 mm. long; fruit globose, red, 2-seeded.

Described from Vitoc, *Ruiz & Pavón*. The generic position of this plant can not be determined satisfactorily from the description and illustration. In appearance it suggests *Coussarea*, but it does not correspond to any species of that genus known from Peru, nor can it be placed more satisfactorily in the other related groups.

63. IXORA L.

Shrubs or small trees, usually glabrous or nearly so; stipules more or less connate, often glandular within; leaves mostly opposite and short-petiolate; inflorescence terminal or rarely axillary; calyx tubular, more or less 4-lobate; corolla salverform, the lobes in bud dextrorsely contorted; stamens inserted in the throat of the corolla, the anthers subsessile; ovary 2-celled, the cells 1-ovulate; fruit somewhat fleshy, 2-seeded or by abortion 1-seeded.

Leaves sessile and clasping at base.....*I. coccinea.*

Leaves on short or elongate petioles, not clasping at base.

Flowers in panicled or racemose heads, the branches of the inflorescence densely pilose with spreading hairs...*I. peruviana.*

Flowers not in panicled heads, the inflorescence minutely puberulent, glabrous, or with minute, appressed hairs.

Corolla glabrous outside.

Inflorescence lax and open, the flowers slender-pedicellate; leaves acuminate; native plant.....*I. Killipii.*

Inflorescence dense and compact, often head-like; leaves obtuse or acute; cultivated plants.

Corolla red or pink; calyx lobes very short, rounded. *I. chinensis.*

Corolla white; calyx lobes oblong to linear-lanceolate, elongate.....*I. Finlaysoniana.*

Corolla minutely puberulent.

Corolla tube 5–6 mm. long; leaves subcoriaceous..*I. escalerae.*

Corolla tube 10–15 mm. long; leaves subcoriaceous.

Leaf blades narrowly oblong-lanceolate or linear-lanceolate, long-acuminate; inflorescence laxly branched, composed of numerous cymes.....*I. intensa.*

Leaf blades oblong or elliptic-oblong, acute or short-acuminate; inflorescence composed usually of 3 head-like cymes.....*I. Ulei.*

Ixora chinensis Lam. Encycl. 3: 344. 1789.

A glabrous shrub; leaves short-petiolate or subsessile, the blades subcoriaceous, oblong or elliptic-oblong, 8–12 cm. long, acute or subobtuse; inflorescence cymose, sessile, dense and many-flowered, the flowers sessile or short-pedicellate; calyx minutely puberulent; corolla red or pink, the filiform tube slightly more than 2 cm. long, the broadly rounded lobes 6 mm. long. "Buquet de novia rosado."

Loreto: Caballo-cocha, cultivated, *Williams 2370*. Native of southeastern Asia, but cultivated for ornament in most tropical regions.

Ixora coccinea L. Sp. Pl. 110. 1753.

A small, dense, nearly or quite glabrous shrub; leaves sessile, broadly oblong to almost rounded, usually conspicuously cordate at the base, obtuse or rounded at the apex, subcoriaceous; inflorescence dense and head-like, sometimes axillary, the flowers sessile or nearly so; calyx lobes broadly ovate, obtuse or acutish; corolla deep red, minutely puberulent or glabrate, the filiform tube 2.5–3 cm. long, the spreading lobes acute. "Buquet de novia."

Loreto: Near Iquitos, *Williams 1544, 1417*. Fortaleza, Yurimaguas, *Williams 4328*. Mishuyacu, in clearing, *Klug 679*. Native of India, but cultivated generally for ornament in tropical regions.

One of the favorite ornamental shrubs of the gardens of tropical America, because of its brilliant red flowers. It is doubtful whether it ever escapes from cultivation, although it may persist about abandoned house sites.

Ixora escalerae Standl. Field Mus. Bot. 8: 173. 1930.

A shrub or small tree, 2–5 meters high, the branchlets strigillose; stipules 4–5 mm. long, linear-subulate; petioles 1–1.5 cm. long; leaf blades oblong-elliptic or lance-oblong, 10–18 cm. long, acuminate, acute or acutish at the base, sparsely strigillose beneath on the veins; inflorescence laxly paniculate, 9 cm. long, the pedicels 3–5 mm. long; calyx remotely and minutely denticulate; corolla white or cream-colored, the lobes oblong, obtuse, 4 mm. long.

Loreto: Cerro de Escalera, 1,200 meters, *Ule 6778*, type. Also in Colombia.

Ixora Finlaysoniana Wall. Cat. No. 6166. 1832, nomen; G. Don, Gen. Syst. 3: 512. 1832.

A densely branched shrub 1–2 meters, high, nearly or quite glabrous; leaves on short, thick petioles, subcoriaceous, the blades

oblong or oblanceolate-oblong, obtuse or acute, attenuate to the base; inflorescence dense and head-like, many-flowered; corolla white, the filiform tube about 3.5 cm. long, the oblong or elliptic, obtuse lobes 6–7 mm. long. "Buquet de novia."

Loreto: Caballo-cocha, *Williams 2129*. Iquitos, *Williams 8248, 1545*. Mishuyacu, in clearing, *Klug 493*.—San Martín: Tarapoto, *Williams 5924*. Native of Siam; cultivated for ornament generally in tropical America.

The plant is one of the favorite ornamental shrubs of tropical American gardens.

Ixora intensa Krause, Notizbl. Bot. Gart. Berlin 6: 205. 1914.

A shrub 1–1.5 meters high with rather stout branches, glabrous almost throughout; leaves subcoriaceous, on thick, short petioles, the blades narrow and elongate, very long-acuminate, acute at the base; inflorescence lax and open, rather copiously branched, the cymules chiefly 3-flowered, the flowers short-petiolate or sessile; corolla red or red and yellow, the lobes spreading or reflexed, rounded, about one-third as long as the tube. Neg. 420.

Loreto: Timbuchi on the Río Nanay, *Williams 1033*. Pinto-cocha, Río Nanay, in forest, *Williams 806*. Mishuyacu, 100 meters, in forest, *Klug 23, 697*. Also along the Amazon in Brazil.

Ixora Killipii Standl. Field Mus. Bot. 8: 174. 1930.

A shrub or small tree, 3–6 meters high, glabrous or nearly so; stipules short, persistent; leaves subsessile, firmly membranaceous, oblong or oblong-elliptic, 8–22 cm. long, acuminate, somewhat narrowed to the base, the base itself usually obtuse or narrowly rounded; inflorescence lax and open, as much as 12 cm. broad, sessile or short-pedunculate, the slender pedicels 1 cm. long or less; calyx lobes triangular, acuminate; corolla cream-colored, the tube filiform, 2–2.5 cm. long, the lobes linear-lanceolate, acute, usually 6–10 mm. long; fruit subglobose, 6–8 mm. in diameter, black or dark purple. "Chimicúa."

Junín: Santa Rosa, 625–900 meters, dense forest, *Killip & Smith 26148*, type.—Loreto: Florida, 180 meters, *Klug 2292*. Yurimaguas, in forest, *Williams 4532, 3877; Killip & Smith 27698*. Puerto Arturo, in forest, *Williams 5120, 5362, 5310, 5307, 5173; Killip & Smith 27921*. Huallaga, Yurimaguas, in forest, *Williams 4650*. Sapoto Yacu, Santa Rosa, in forest, *Williams 4920, 4916*.—Without locality: *Poeppig 2242*. Also in Bolivia and Colombia.

Ixora peruviana (Spruce) Standl. Field Mus. Bot. 11: 217. 1936. *Cephalanthus peruvianus* Spruce ex Schum. in Mart. Fl. Bras. 6, pt. 6: 129. 1888. *C. breviflorus* Spruce ex Schum. loc. cit.

A shrub 3 meters high with stout branches, the branchlets glabrous; stipules persistent, 8–10 mm. long; leaves on rather long petioles, the blades subcoriaceous, obovate to oblong-oblanceolate, short-acuminate or rounded and apiculate, long-attenuate to the base, glabrous; inflorescences sessile, the heads long-pedunculate, dense, many-flowered; hypanthium densely pilose; corolla white, more or less pilose outside, 6–10 mm. long, the lobes equaling the tube or shorter, linear-oblong, spreading; fruit subglobose, 6–7 mm. long, thinly pilose. Negs. 272, 273.

Loreto: Pebas on the Amazon, *Williams 1568*.—San Martín: Tarapoto, *Spruce 4910*, type collection of *C. peruvianus; Spruce 4175*, type collection of *C. breviflorus; Williams 6717, 6716, 6595*. Juan Jui, 400 meters, in forest, *Klug 3867*. Also in Bolivia and Amazonian Brazil.

The flowers are said to be strongly sweet-scented. From Brazil this species is described as a tree of 19 meters, perhaps in error.

Ixora Ulei Krause, Notizbl. Bot. Gart. Berlin 6: 205. 1914.

A shrub 2 meters high, almost glabrous; leaves on stout petioles 1–1.5 cm. long, the blades subcoriaceous, acute at the base; inflorescence sessile, the flowers sessile or short-pedicellate; calyx puberulent, the lobes ovate, acute; corolla yellow and red, the lobes oval, obtuse, one-third as long as the tube or shorter. Neg. 421.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1100*. Also in Brazil.

In Brazil this species is reported as a tree of 7.5 meters.

64. COUSSAREA Aubl.

Shrubs or trees, usually glabrous; stipules commonly ovate-triangular, muticous, apiculate, or truncate, never subulate-aristate nor connate into a long intrapetiolar sheath; leaves opposite or rarely verticillate, short-petiolate or subsessile, more or less coriaceous; inflorescence terminal; calyx cupular and truncate, sometimes 4-dentate or rarely with 4 linear lobes; corolla funnelform or salverform, the throat naked, the 4 lobes valvate in bud; anthers subsessile in the corolla tube; ovary 2-celled; fruit baccate, by abortion commonly 1-seeded, longer than broad.

Leaves sessile or practically so, narrowed to an obtuse or cordate base.

Leaves 3–6 cm. wide, not abruptly contracted at the base; pedicels 4–15 mm. long.....*C. sessilifolia.*

Leaves 6–13 cm. wide, abruptly contracted at the base; pedicels 1–2 mm. long.....*C. auriculata.*

Leaves petiolate, the blades acute at the base.

Leaves densely short-pilose beneath.

Flowers simply capitate.....*C. megalocarpa.*

Flowers in cymose heads.....*C. obliqua.*

Leaves glabrous or practically so.

Flowers in heads or head-like umbels.

Flowers capitate or in head-like umbels; corolla lobes equaling or longer than the tube.

Lobes of the corolla about equaling the tube; leaves subcoriaceous.....*C. brevicaulis.*

Lobes of the corolla almost twice as long as the tube; leaves membranaceous.....*C. liliiflora.*

Flowers in trichotomous heads; corolla lobes shorter than the tube.

Calyx deeply dentate, the teeth acute; corolla lobes slightly shorter than the tube.....*C. flava.*

Calyx obscurely denticulate; corolla lobes less than half as long as the tube.....*C. tricephala.*

Flowers in panicles or corymbs.

Corolla lobes much longer than the tube.

Corolla spirally twisted in bud, the lobes twice as long as the tube; flowers subsessile.....*C. hydrangeifolia.*

Corolla not twisted in bud, the lobes less than twice as long as the tube; flowers pedicellate.....*C. tortilis.*

Corolla lobes equaling or shorter than the tube.

Corolla tube 20–35 mm. long.

Calyx minutely puberulent or almost glabrous.
C. tenuiflora.

Calyx hispidulous.

Corolla tube 2 cm. long, the lobes 5–6 mm. long.
C. hirticalyx.

Corolla tube 3–3.5 cm. long, the lobes 2–3 cm. long. *C. macrantha.*

Corolla tube 5–10 mm. long.

Corolla glabrous; leaves 2–3 cm. wide. *C. longiacuminata.*

Corolla minutely puberulent; leaves 5–9.5 cm. wide.

Leaves coriaceous, rounded and abruptly caudate at the apex..... *C. ovalis.*

Leaves thin, acute and gradually caudate-acuminate. *C. rudgeoides.*

Coussarea auriculata Standl. Field Mus. Bot. 4: 330. 1929.

Glabrous or nearly so; stipules broadly triangular, 2–3.5 mm. long, obtuse or almost truncate; leaves broadly elliptic or elliptic-obovate, 11–19 cm. long, acuminate, narrowly cordate at the base, subcoriaceous; inflorescence thyrsoid-paniculate, short-pedunculate, 6–7 cm. broad, many-flowered; calyx truncate; corolla tube 7 mm. long, the lobes oblong-linear, 4 mm. long, obtuse.

Amazonas: Pongo de Manseriche, mouth of Río Santiago, *Tessmann 4647*, type.—San Martín: Pongo de Cainarachi, 230 meters, in forest, a tree of 5 meters with white flowers, *Klug 2728*. Also in Bolivia.

Coussarea brevicaulis Krause, Bot. Jahrb. 40: 142. 1907, nomen; Verh. Bot. Ver. Brandenb. 50: 117. 1908. *C. benensis* Britton ex Standl. Field Mus. Bot. 7: 296. 1931.

A shrub 1–4.5 meters high, glabrous almost throughout; stipules broadly ovate, obtuse, 3–3.5 mm. long; leaves short-petiolate, coriaceous, the blades elliptic-oblong to lance-oblong, 10–20 cm. long, long-acuminate, acute at the base; umbels head-like, 3–7-flowered, short-pedunculate or subsessile; calyx 4-dentate; corolla white or cream-colored, pruinose-puberulent or almost glabrous, 2–4 cm. long, the lobes and tube subequal; fruit ellipsoid-globose, white, 2 cm. long. Neg. 786.

Loreto: Puerto Arturo, Yurimaguas, in forest, *Williams 5258, 5259*. Caballo-cocha on the Amazon, in forest, *Williams 2310*. Masana, edge of forest, *Williams 8175*. Florida, 180 meters, *Klug 2362*. Balsapuerto, 150–350 meters, *Killip & Smith 28566*. Soledad, 110 meters, *Killip & Smith 29678*. Also in adjacent Brazil and in Bolivia.

Coussarea flava P. & E. Nov. Gen. & Sp. 3: 26. *pl. 231.* 1845.

A shrub 2 meters high; leaves short-petiolate, the blades lance-oblong to elliptic-oblong, as much as 24 cm. long and 7.5 cm. wide, long-acuminate, attenuate to the base, glabrous; stipules ovate, acute; flowers arranged in 3 pedunculate heads; calyx sericeous, deeply dentate; corolla sericeous, the lanceolate lobes slightly shorter than the tube; fruit globose, as large as a walnut.

San Martín: Misión Tocache, *Poeppig*, type.

I have seen no material of this species, of which *C. tricephala* Standl. may be a synonym. The two plants are much alike in general appearance but the flower details of *C. flava*, as described, are conspicuously different from those of *C. tricephala*.

Coussarea hirticalyx Standl. Field Mus. Bot. 8: 175. 1930.

A shrub or tree 3–7.5 meters high, almost glabrous; stipules caducous; leaves petiolate, the blades firm-membranaceous, broadly elliptic or elliptic-oblong, 14–20 cm. long, 6–9.5 cm. wide, caudate-acuminate, acute or obtuse at the base, sparsely hispidulous beneath on the veins; inflorescence ovoid-paniculate, short-pedunculate, 6–9 cm. long and broad, the branches minutely sericeous or glabrate, the flowers sessile or subsessile; calyx 2–2.8 mm. long, truncate or obsoletely denticulate; corolla white, minutely puberulent, the tube 2 cm. long, the oblong-linear lobes 5–6 mm. long.

Loreto: La Victoria, on the Amazon, in forest, *Williams 2528*, type. Caballo-cocha, on the Amazon, in forest, *Williams 2504, 2406*. Iquitos, 100 meters, in forest, *Killip & Smith 27191, 27198*.

Coussarea hydrangeifolia (Benth.) B. & H. ex Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 94. 1881. *Faramea hydrangeifolia* Benth. Linnaea 23: 451. 1850.

A nearly glabrous shrub 2.5–3.5 meters high; stipules triangular, acute; leaves short-petiolate, the blades oblong-ovate to rounded-ovate, as much as 20 cm. long, shortly cuspidate-acuminate, usually obtuse or rounded at the base; panicles short, ovoid, few- or many-flowered, the flowers nearly sessile; calyx truncate, sometimes obscurely denticulate; corolla glabrous, 10 mm. long, the lobes twice as long as the tube; fruit ellipsoid, 8 mm. long. Neg. 6152.

San Martín: Near Tarapoto, *Spruce 4423*. Also in Bolivia and Brazil.

Coussarea liliiflora Standl. Field Mus. Bot. 11: 197. 1936.

A glabrous tree; stipules 1.5–2 mm. long, subulate-mucronate from a rounded-triangular base; leaves rather long-petiolate, mem-

branaceous, the blades ovate-oblong or elliptic-oblong, 4–7 cm. long, 2–3 cm. wide, abruptly caudate-acuminate, abruptly contracted and decurrent at the base, with about 6 pairs of lateral nerves; flowers terminal, solitary or ternate, subsessile or short-pedicellate, the hypanthium 2–3 mm. long; calyx broadly campanulate, 2.5–3 mm. long, truncate and remotely dentate; corolla narrowly linear in bud, long-attenuate to the apex, the slender tube 2 cm. long, the 4 lobes linear, 3.5 cm. long, 2 mm. wide.

Loreto: Mouth of Río Santiago on the Río Marañón, upland forest, 160 meters, *Tessmann 4621*, type.

Coussarea longiacuminata Standl. Field Mus. Bot. 4: 330. 1929.

A glabrous shrub or small tree; stipules persistent, 2–2.5 mm. long; leaves short-petiolate, the blades coriaceous, narrowly elliptic-oblong, 7–9.5 cm. long, caudate-acuminate, acute at the base; inflorescence cymose-paniculate, sessile or short-pedunculate, laxly few-flowered, trichotomous at the base, the pedicels 3 mm. long; calyx 4-denticulate; corolla tube slender, 9–10 mm. long, the lobes 4–5 mm. long.

Cajamarca; Tabaconas, 2,400 meters, *Weberbauer 6117*, type.

Coussarea macrantha Standl. Field Mus. Bot. 11: 197. 1936.

A shrub 1 meter high, glabrous except in the inflorescence; stipules deciduous, 4–5 mm. long; leaves short-petiolate, thick-membranaceous, fuscous when dried, the blades broadly elliptic or oblong-elliptic, 17–24 cm. long, 8–13 cm. wide, abruptly attenuate-acuminate, rounded or acute at the base; inflorescence short-pedunculate, cymose-corymbose, trichotomous at the base, 10 cm. long, the cymes umbelliform, the branches sparsely puberulent; hypanthium densely sericeous, the calyx 4 mm. long, remotely denticulate, sparsely sericeous and hispidulous; corolla white, minutely puberulent, the lobes linear-lanceolate.

Loreto: Florida, on the Río Putumayo, 200 meters, in forest, *Klug 2070*, type.

Coussarea megalocarpa Standl. Field Mus. Bot. 8: 366. 1931.

A small tree, the branchlets sparsely puberulent; stipules deciduous; leaves short-petiolate, firm-membranaceous, the blades elliptic or oblong-elliptic, 12–18 cm. long, 4.5–8 cm. wide, long-acuminate, acute at the base, minutely puberulent above on the veins; inflorescence capitate, densely many-flowered, short-pedunculate; calyx

lobes linear or subulate, 12 mm. long or less; fruit oval-globose, 3 cm. long, sparsely puberulent or pilosulous.

Loreto: Río Masana near Iquitos, 125 meters, *Williams 8171*, type.

Coussarea obliqua Standl. Field Mus. Bot. 11: 199. 1936.

A tree 5 meters high, the branchlets glabrous; stipules 6–7 mm. long; leaves petiolate, subcoriaceous, fuscous when dried, the blades oblong or elliptic-oblong, 20 cm. long, 9 cm. wide, cuspidate-acuminate, acute and oblique at the base, glabrous above, beneath densely and minutely appressed-pilose; inflorescence pedunculate, cymose, 9 cm. long, composed of several pedunculate, densely many-flowered heads; hypanthium minutely puberulent or glabrate, the calyx rounded-lobulate; corolla cream-colored, glabrous, the slender tube 2.5 cm. long, the narrow lobes 10–12 mm. long.

Loreto: Florida, on the Río Putumayo, 200 meters, in forest, *Klug 1987*, type.

Coussarea ovalis Standl. Field Mus. Bot. 8: 367. 1931.

Almost glabrous; stipules 8 mm. long, broadly rounded and subulate-acuminate; leaves coriaceous, short-petiolate, the blades oval, 14–17 cm. long, rounded at the apex and caudate, obtuse or acute at the base; inflorescence thyrsoid-paniculate, 5–9 cm. long, sessile or pedunculate, many-flowered, the flowers sessile; calyx 1.5 mm. long, glabrous, truncate; corolla minutely pulverulent, the tube 5–6 mm. long, the lobes 4.5 mm. long. "Chorchulla."

Loreto: Paraíso on Río Itaya, *Williams 3355*, type. Fortaleza, 140 meters, in forest, a tree of 12 meters with white flowers, *Klug 2777*.

Coussarea rudgeoides Rusby, Mem. Torrey Club 6: 48. 1896.

A nearly glabrous shrub or tree 2.5–5 meters high with rather slender branches; stipules 3–4 mm. long, rounded at the apex; leaves nearly sessile or short-petiolate, the blades elliptic-oblong to lance-oblong, 12–25 cm. long, 5–10 cm. wide, acute or abruptly acuminate at the base; flowers cymose-paniculate, the panicles 5–6 cm. long, pedunculate; calyx truncate, obscurely denticulate; corolla white, 12 mm. long, the lobes half as long as the tube; fruit white, ellipsoid, about 1 cm. long.

Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26450*.—Loreto: Between Yurimaguas and Balsapuerto, 140 meters, dense forest, *Killip & Smith 28118*. Fortaleza, 140 meters,

Klug 2786.—San Martín: Forests of Mount Guayrapurina, *Spruce 3918.* Also in Bolivia.

It is possible that this may be *Coffea acuminata* R. & P., since it resembles the figure of that species in foliage characters.

Coussarea sessilifolia Standl. Field Mus. Bot. 8: 367. 1931.

A glabrous shrub with slender branches; stipules 1 mm. long, subtruncate and mucronate; leaves sessile or nearly so, elliptic-oblong or obovate-elliptic, 6.5–11 cm. long, abruptly short-acuminate, rounded or shallowly cordate at the base; inflorescence cymose-paniculate, long-pedunculate, laxly few-flowered; calyx 2 mm. long, shallowly dentate; corolla glabrous, 18 mm. long, the linear lobes almost twice as long as the slender tube.

Loreto: Puerto Arturo, Yurimaguas, 200 meters, in forest, *Williams 5084* (type), *5201.*

Coussarea tenuiflora Standl. Field Mus. Bot. 4: 331. 1929.

A nearly glabrous shrub; stipules deciduous; leaves petiolate, subcoriaceous, the blades ovate-elliptic or broadly elliptic, 12–30 cm. long, caudate-acuminate, acute to rounded at the base; inflorescence cymose-corymbose, subsessile or rather long-pedunculate, trichotomous, few- or many-flowered, the flowers sessile; calyx 1.6 mm. long, truncate; corolla tube 25–28 mm. long or longer, the lobes oblong, obtuse, puberulent outside and commonly short-barbate at the tips; fruit ellipsoid, 1.5–2 cm. long. "Supi caspi," "motelo micuna," "ginsira caspi."

Loreto: Yurimaguas, in forest, *Williams 7830, 4172.* Puerto Arturo, in forest, *Williams 5177.* Parana Pura, Yurimaguas, *Williams 4622.* Mainas, *Poeppig 2256.* Masana, Iquitos, *Williams 8152.*—San Martín: Near Tarapoto, *Spruce 4422,* type. Rumizapa, near Tarapoto, *Williams 6775.* Also in adjacent Brazil.

Coussarea tortilis Standl., sp. nov.

Arbor 10-metralis omnino glabra, ramulis ut videtur gracilibus in sicco viridescentibus, internodiis elongatis; stipulae virides 7 mm. longae ovato-ovales obtusae; folia magna breviter petiolata papyracea, petiolo gracili circa 1.5 cm. longo; lamina late ovali-ovata circa 22 cm. longa et 12 cm. lata abrupte caudato-acuminata, acumine angusto attenuato 2.5 cm. longo, basi late rotundata abrupte contracta et triangulari-decurrens, supra in sicco laete viridis, nervulis prominulis, subtus paullo pallidior, costa gracili atque elevata, nervis lateralibus utroque latere circa 9 tenuibus prominentibus

pallidis, in axillis domatiatis, venulis prominentibus laxe reticulatis; flores albi cymoso-paniculati, paniculis 1.5–2 cm. longe pedunculatis laxe multifloris 5–6 cm. longis et fere aequilatis, ramis pallidis plus minusve compressis, bracteis minutis inconspicuis, pedicellis ad 4 mm. longis; hypanthium oblongum 1.5 mm. longum, calyce campanulato 1 mm. longo pallido truncato et minute remote denticulato; corolla in alabastro anguste linearis spiraliter torta, tubo gracili 7–8 mm. longo, lobis anguste linearibus 12 mm. longis intus minute sparse puberulis.

San Martín: Pongo de Cainarachi, Río Cainarachi, a tributary of the Río Huallaga, 230 meters, in forest, *Klug 2700* (herb. Field Mus. No. 675,992, type).

Coussarea tricephala Standl. Field Mus. Bot. 8: 368. 1931.

A nearly glabrous shrub; stipules broadly ovate, obtuse; leaves short-petiolate, the blades membrancaeous, elliptic-oblong, 10.5–16 cm. long, 3.5–6 cm. wide, long-acuminate, attenuate to the base, minutely pilosulous above on the nerves; inflorescence of 3 small, stalked heads on a common short peduncle, the heads 1 cm. in diameter; calyx 2 mm. long, obsoletely denticulate; corolla glabrous or sparsely and minutely puberulent, the tube slender, 2.5 cm. long, the lobes linear-oblong, obtuse, sparsely hispidulous at the apex, 1 cm. long.

San Martín: Tarapoto, *Williams 6533*, type.

65. FARAMEA Aubl.

Shrubs or small trees, usually glabrous throughout; stipules short-triangular and long-aristate, or often long-sheathing; leaves opposite, petiolate or subsessile, most frequently coriaceous; inflorescences various, terminal or axillary, few- or many-flowered; calyx tubular or urceolate, truncate or dentate; corolla commonly salverform, the 4 lobes valvate in bud, the throat naked; anthers subsessile in the corolla tube; ovary 1-celled; fruit baccate or almost dry, by abortion 1-seeded, the seed horizontal, deeply excavate on the lower side.

Flowers densely clustered in the leaf axils..... *F. axillaris.*

Flowers in terminal inflorescences, or at least never densely glomerate in the leaf axils.

Inflorescence with large, brightly colored, foliaceous bracts. *F. anisocalyx.*

Inflorescence with small or minute and inconspicuous bracts.

Flowers in simple umbels, these solitary or clustered.

F. quinqueflora.

Flowers numerous, paniculate or corymbose.

Leaves conspicuously 3-nerved, the lateral nerves joined to form an almost regular, submarginal, collective nerve.

Corolla in bud 5 mm. long; stipules 3.5–4 cm. long.

F. miconioides.

Corolla in bud 10–15 mm. long; stipules small.

Lateral nerves of the leaves perpendicular to the costa; leaf blades perfectly oblong.....*F. exemplaris.*

Lateral nerves of the leaves oblique; leaves oblong-elliptic.....*F. Harmsiana.*

Leaves not at all 3-nerved, the lateral nerves not united to form a distinct collective nerve.

Leaves cordate or subcordate at the base, sessile.

F. subsessilis.

Leaves acute to obtuse at the base, usually distinctly petiolate.

Stipules long-connate into a sheath, this with short-aristate lobes, usually persistent.

Calyx with distinct, subulate-acuminate lobes.

F. phyllonomoides.

Calyx truncate or with minute and often obtuse teeth.

F. maynensis.

Stipules short-connate or almost distinct, long-aristate, not forming a sheath, often deciduous.

Pedicels much elongate, equaling or exceeding the flowers, often flexuous, capillary...*F. capillipes.*

Pedicels much shorter than the flowers, straight or nearly so, stouter.

Inflorescence condensed and head-like..*F. congesta.*

Inflorescence open, not head-like.

Leaf blades large, commonly 7–13 cm. wide.

Calyx truncate; lateral nerves almost perpendicular to the costa.....*F. rectinervia.*

Calyx with conspicuous, subulate teeth; lateral nerves oblique.....*F. amplifolia.*

Leaf blades commonly 3–6 cm. wide.

Lobes of the corolla half as long as the tube or shorter. Leaves coriaceous; inflorescence few-flowered.....*F. coerulescens.*

Lobes of the corolla about equaling the tube, sometimes slightly shorter or longer.

Corolla 1 cm. long.....*F. glandulosa.*

Corolla about 2 cm. long.....*F. occidentalis.*

Faramea amplifolia Standl. Field Mus. Bot. 8: 177. 1930.

A glabrous shrub or tree with thick branchlets; stipules soon deciduous; leaves short-petiolate, subcoriaceous, the blades elliptic-oblong to narrowly oval, 22–28 cm. long, 9.5–13 cm. wide, rounded and short-cuspidate at the apex, obtuse or acutish at the base, paler beneath; inflorescence sessile, cymose-paniculate, large and many-flowered, 12–18 cm. long and broad, the pedicels 2–10 mm. long; calyx distinctly dentate, the teeth triangular-subulate; corolla in bud 4–5 mm. long, acutely angulate, the lobes and tube subequal; fruit depressed-globose, 8–13 mm. wide.

Loreto: Pebas, on the Amazon, in forest, *Williams 1946* (type), *1575*. Puerto Arturo, 200 meters, in forest, *Williams 5355*.

Faramea anisocalyx P. & E. Nov. Gen. & Sp. 3: 28. 1845.

A glabrous shrub or small tree, 7.5 meters high or less, with slender branches; stipules short, broadly ovate, long-aristate, deciduous; leaves thick-membranaceous, short-petiolate or subsessile, the blades oblong or obovate-oblong, caudate-acuminate, acutish to attenuate at the base, lustrous; peduncles commonly 3 at the end of each branch, the flowers umbellate at their tips, pedicellate; bracts large and leaf-like, ovate or elliptic, petiolate; calyx lobes often unequal, with 2 of them longer than the others; corolla blue with a whitish tube; fruit reported as white or purple-black. Negs. 805, 8619.

Junín: Cahuapanas, 340 meters, dense forest, *Killip & Smith 26723*.—Loreto: Entre Ríos, *Fox 17*. Near Yurimaguas, 180 meters, *Mexia 6084*. Caballo-cocha, *Osgood 10; Williams 2209*. Mainas, *Poeppig 805, 2030* (perhaps the type collections). La Victoria, in or at edge of forest, *Williams 2759, 2967*. Yurimaguas, in forest, *Williams 4122; Tessmann 5504*. Santa Rosa, *Williams 4864*. Iquitos, *Killip & Smith 27333, 27119*. Punchana, in jungle, *Williams 1330*. Pebas, *Williams 1898*. Soledad, 110 meters, *Killip & Smith*

29797.—San Martín: Type from Misión Tocache, *Poeppig*.—Without locality, *Pavón*. Also in Bolivia and Amazonian Brazil.

"Uchu sanango." The species is easy of recognition because of the large and brightly colored bracts, which are reported variously as blue, pink, or white. Some of the specimens have been determined as *Faramea Schwackei* Schum. & Krause, a species described from Amazonian Brazil, which does not seem to differ from *F. anisocalyx*.

Of the plant Huber (Bol. Mus. Paraense 4: 615. 1906) writes as follows: "This shrub is one of the most beautiful ornaments of the Ucayali region because of its bracts, which are of a pure sky blue and literally cover the plants when in flower. Crossing the forest west of Sarayacu I was deceived several times by the numerous shrubs of this species, thinking that I was seeing the sky through the trees."

Faramea axillaris Standl. Field Mus. Bot. 8: 178. 1930.

A glabrous shrub 1.5 meters high or less, sparsely branched or almost simple; stipules persistent, broadly triangular, long-aristate; leaves almost sessile, membranaceous or thicker, oblanceolate-oblong or obovate-oblong, 8–19 cm. long, abruptly acute or short-acuminate, narrowed to the acute or obtuse base; flowers densely fasciculate in the leaf axils or in small, dense cymes, sessile or subsessile; calyx truncate; corolla white, the tube 4 mm. long, the acuminate lobes slightly shorter; fruit blue, globose, almost 1 cm. long.

Loreto: Balsapuerto, 150–350 meters, dense forest, *Killip & Smith 28655*, type. Santa Rosa, in forest, *Williams 4954; Killip & Smith 28900, 28711, 28939*. Yurimaguas, 135 meters, *Killip & Smith 28198*. Soledad, *Killip & Smith 29643*. Puerto Arturo, in forest, *Williams 5103; Killip & Smith 27924*. Paraíso, Alto Itaya, *Williams 3368*.—Amazonas: Mouth of Río Santiago, 160 meters, upland forest, *Tessmann 4593*.

Faramea capillipes Muell. Arg. Flora 58: 474. 1875.

A glabrous shrub 3 meters high with slender branches; stipules short, triangular, long-aristate; leaves short-petiolate, subcoriaceous, the blades oblanceolate-oblong to oblong-obovate, 5–12 cm. long, cuspidate-acuminate, acute or attenuate at the base; inflorescences terminal and from the upper axils, sessile or pedunculate, few- or many-flowered, very lax and open, with long, slender pedicels, the flowers cymose or subumbellate; calyx truncate; corolla 12 mm. long, the narrow, attenuate lobes much exceeding the thick tube;

fruit globose, 6–8 mm. in diameter. "Chaleta," "kikin-kaka." Neg. 809.

Amazonas: Mouth of Río Santiago, *Tessmann 4293.*—Loreto: Santa Ana, *Williams 1234.* Leticia, *Ule 6220.* Río Nanay, forest, *Williams 753.* Mishuyacu, 100 meters, in forest, *Klug 691.* Also in Amazonian Brazil and in Venezuela.

Faramea coerulescens Schum. & Krause, Bot. Jahrb. 40: 347. 1908.

A densely branched, glabrous shrub or small tree 3–5 meters high; stipules triangular, acuminate, 3–4 mm. long; leaves short-petiolate, coriaceous, the blades obovate or oblong-elliptic, 4–8 cm. long, 1.5–4.5 cm. wide, obtusely short-acuminate or acutish, acute or acutish at the base; flowers subcorymbose, few, on short or elongate, usually stout pedicels, fragrant; calyx 4-dentate; corolla white, the rather stout tube 1.5–2 cm. long, the lobes ovate, much shorter. Neg. 811.

Amazonas: Chachapoyas, *Mathews.*—Without locality: *Ruiz & Pavón; Weberbauer 7151.* Also in the mountains of Ecuador.

Faramea congesta Huber, Bol. Mus. Paraense 4: 615. 1906.

A shrub 1–2 meters high; leaves short-petiolate or subsessile; stipules short-connate, long-aristate; leaf blades ovate or oblong-lanceolate, 10–15 cm. long, 3.5–5.5 cm. wide, falcately long-acuminate, acute or short-acuminate at the base, glabrous above, pilosulous beneath on the nerves or glabrate, ciliate; inflorescence subsessile, condensed and head-like, hirtellous, 10–20-flowered; corolla white, 13 mm. long; calyx lobes subulate, recurved or revolute; lobes of the corolla equaling the tube.

Loreto: Type from Cerro de Chanchahuaya, *Huber.*

Faramea exemplaris Standl. Field Mus. Bot. 11: 205. 1936.

A shrub or small tree 4 meters high, glabrous throughout, the branches slender, obtusely tetragonous; stipules deciduous, cuspidate-attenuate from an ovate-triangular base; leaves large, short-petiolate, the blades oblong, 20–26 cm. long, 5.5–8.5 cm. wide, rather abruptly caudate-acuminate, the tip linear and elongate, rounded or obtuse at the base or rarely subacute, strongly bullate, the lateral nerves about 24 on each side, strongly elevated beneath; inflorescence large, laxly many-flowered, pedunculate, about 11 cm. long and broad, the pedicels 2–3 mm. long; calyx less than 1 mm. long; corolla in bud 12–13 mm. long, long-attenuate, the lobes almost twice as long as the tube, yellow.

Loreto: Mouth of the Río Santiago, upper Marañón, 160 meters, in upland forest, *Tessmann 4562*, type.

Faramea glandulosa P. & E. Nov. Gen. & Sp. 3: 29. *pl. 234*. 1845.

A glabrous shrub or small tree 2–6 meters high, with slender or rather stout branches; stipules deltoid or ovate, long-aristate, mostly deciduous; leaves short-petiolate, subcoriaceous or thick-membranaceous, chiefly oblong, gradually or abruptly caudate-acuminate, acute or obtuse at the base, lustrous; flowers fragrant, cymose-paniculate, the panicles few- or many-flowered, sessile or pedunculate, usually rather open, stiffly branched, the flowers short-pedicellate; calyx 4-dentate; corolla white or blue, 8–10 mm. long, the lobes equaling or somewhat longer than the tube; fruit subglobose, black or purple. Neg. 818.

Huánuco: Type from Cochero, *Poeppig*.—Junín: San Nicolás, 1,100 meters, *Killip & Smith 25976*. La Merced, 1,200 meters, *Macbride 5716*.—Loreto: Yurimaguas, in forest, *Williams 3892, 4527; Mexia 6083; Killip & Smith 28053*. Mainas, *Poeppig 2067, 2124*. San Antonio, *Williams 3498; Killip & Smith 29451, 29336, 29327*. Puerto Arturo, 135 meters, *Killip & Smith 27804*. Soledad, *Killip & Smith 29799, 29629, 29577*. Iquitos, in forest, *Williams 3682, 1489; Killip & Smith 27193*. Paraíso, *Williams 3321, 3370, 3376*. Mishuyacu, *Killip & Smith 29964; Klug 444*. San Ramón, in forest, *Williams 4571*. Río Itaya, *Williams 231, 109*. La Victoria, *Williams 2525*. Manfinfa, *Williams 1129*. Balsapuerto, *Killip & Smith 28397*.—San Martín: Near Tarapoto, *Spruce 4612; Williams 6093, 6065*. Between Tarapoto and Chasuta, *Raimondi 948*.—Without locality: *Poeppig 1444*. Also in Amazonian Brazil.

"Charichuela," "situlli caspi." Some of the collections cited have been referred erroneously to *F. candelabrum* Standl., a Bolivian species. Others have been determined as *F. amazonica* Muell. Arg., a species that I do not believe is distinct from *F. glandulosa*. The ample material at hand is somewhat variable, however, and it is possible that it represents more than a single species, although no lines of segregation are now apparent.

Faramea Harmsiana Standl. Field Mus. Bot. 11: 207. 1936.

A shrub 1.5 meters high, glabrous throughout, the branchlets acutely quadrangular; stipules sheathing, 1 cm. long, the lobes obtuse or rounded and mucronate; leaves large, short-petiolate, firm-papyraceous, the blades oblong-elliptic, 26 cm. long and 11

cm. wide, abruptly short-acuminate, acute or subacute at the base, the lateral nerves about 16 pairs, diverging at almost a right angle; inflorescence cymose-corymbose, pedunculate, the flowers short-pedicellate; calyx cupular, 0.5 mm. long; corolla pale blue, the slender tube 7–9 mm. long, the 4 lobes lance-oblong, 4–5 mm. long, acute.

Loreto: Upper Marañón, mouth of Río Santiago, upland forest, 160 meters, *Tessmann 4570*, type.

Faramea maynensis Spruce ex B. & H. Gen. Pl. 2: 121. 1873, nomen; ex Rusby, Bull. N. Y. Bot. Gard. 4: 300. 1907. *Rudgea scandens* Krause, Bot. Jahrb. 40: 342. 1908.

A glabrous shrub with slender branches, said to be sometimes scandent; stipules green, connate into a narrow and commonly persistent sheath; leaves short-petiolate, usually thin, oblong or narrowly oblong, less often obovate-oblong, caudate-acuminate, acute or obtuse at the base; inflorescence usually many flowered, cymose-corymbose, sessile or pedunculate, the flowers slender-pedicellate; corolla blue, 12–17 mm. long, the lobes equaling or shorter than the tube; fruit 10–14 mm. wide. Negs. 687, 836, 22810.

Ayacucho: Kimpitiriki, 400 meters, *Killip & Smith 23000.*—Huánuco: Below Posuso, *Tessmann 3905.*—Junín: Chanchamayo Valley, 1,200–1,500 meters, *Schunke 322, 428.* La Merced, 1,000 meters, open forest, *Weberbauer 1814*, type of *Rudgea scandens.*—Loreto: Yurimaguas, *Williams 7820.* Mainas, *Poeppig 2010.* La Victoria, on the Amazon, in forest, *Williams 2710, 2766.* Fortaleza, 140 meters, *Klug 2783.* Balsapuerto, 220 meters, *Klug 2916.* Caballo-cocha, *Williams 2208, 2107, 2262a, 2485, 2361.* San Antonio, 135 meters, *Tessmann 3785; Killip & Smith 29441.*—San Martín: Near Tarapoto, *Spruce 4946*, type collection. Río Mayo, *Spruce 4612.* Also in Bolivia, Ecuador, Brazil, and Colombia.

Faramea miconioides Standl. Field Mus. Bot. 8: 178. 1930.

A glabrous shrub 1 meter high with stout branches; stipules connate into an elongate sheath, 3.5–4 cm. long; leaves short-petiolate, subcoriaceous, the blades elliptic-oblong or obovate-oblong, 14–16 cm. long, 5.5–6.5 cm. wide, short-acuminate, acute at the base; nerves about 19 pairs, divergent at almost a right angle; inflorescence sessile, cymose-paniculate, many-flowered, 4.5 cm. long, the pedicels 3 mm. long; calyx lobes linear-oblong, obtuse; corolla blue, in bud 5 mm. long.

Junín: Dos de Mayo, Pichis Trail, 1,800 meters, dense forest, *Killip & Smith 25808*, type.—Without locality: *Poeppig 2062.*

Noteworthy for the extreme development of the stipules.

Faramea occidentalis (L.) A. Rich. Mém. Soc. Hist. Nat. Paris 5: 176. 1834. *Ixora occidentalis* L. Syst. Nat. ed. 10. 2: 893. 1759. *F. odoratissima* DC. Prodr. 4: 496. 1830.

A slender, glabrous shrub or small tree; stipules small, short, aristate; leaves short-petiolate, oblong or lance-oblong, short-acuminate, acute or attenuate at the base, rather thin, usually blackish when dried; inflorescences terminal and axillary, few-flowered, usually corymbose, sometimes umbellate, the flowers long-pedicellate, white, fragrant; corolla glabrous, 2 cm. long, the linear-lanceolate lobes equaling or longer than the tube; fruit 1.5 cm. broad.

San Martín: Juan Jui, Alto Río Huallaga, 400 meters, in forest, *Klug 3877*. Ranging to Mexico and the West Indies.

Faramea phyllonomoides Standl. Field Mus. Bot. 4: 332. 1929.

A glabrous shrub or small tree with slender branches; stipules sheathing, persistent; leaves almost sessile, firm-membranaceous, narrowly elliptic-oblong or oblanceolate-oblong, 6–10.5 cm. long, 1.7–3.5 cm. wide, caudate-acuminate, acute or obtuse at the base; inflorescence cymose-paniculate, sessile, laxly few-flowered, the flowers mostly subumbellate, the pedicels 2–6 mm. long; calyx teeth remote, triangular-subulate.

Junín: Chanchamayo Valley, 1,500 meters, *Schunke 277* (type), *439*. Above San Ramón, 1,300–1,700 meters, *Schunke A24*.

It is questionable whether this is distinct from *F. maynensis*.

Faramea quinqueflora P. & E. Nov. Gen. & Sp. 3: 28. *pl. 234*. 1845. *Coussarea bryoxenos* Schum. & Krause, Verh. Bot. Ver. Brandenb. 50: 116. 1908.

A glabrous shrub or small tree 1–7.5 meters high, with slender branches; stipules connate into a narrow, persistent sheath, the lobes aristate; leaves thin, short-petiolate, oblong or narrowly lance-oblong, rather small, caudate-acuminate or attenuate-acuminate, acute or obtuse at the base; flowers umbellate, the umbels few- or many-flowered, the pedicels slender, elongate; calyx obscurely 4-denticulate; corolla pale blue, the slender tube 5–10 mm. long, the narrow lobes of equal length; fruit subglobose or depressed, deep blue to blackish or purple. Negs. 787, 838.

Loreto: Iquitos, edge of forest, *Williams 8164; Tessmann 3695; Killip & Smith 27311, 27028*. Soledad, 110 meters, in forest, *Killip & Smith 29740, 29780, 29820*. Pampas de Ponasa, *Ule 6777*, type

of *Coussarea bryoxenos*. Santa Ana, *Williams 1240*. Punchana, in forest, *Williams 3760*. Santa Rosa, *Killip & Smith 28948*. Mishuyacu, 100 meters, *Klug 1052, 1554*.—San Martín: Type from forests of Misión Tocache, *Poeppig* (photo. seen of *Poeppig 2010* ex hb. Berol.). Tarapoto, *Williams 5750; Spruce 4296*. Also in Colombia.

Faramea rectinervia Standl. Field Mus. Bot. 8: 177. 1930.

A small, glabrous tree; stipules broadly ovate, 7–9 mm. long, short-cuspidate; leaves short-petiolate, subcoriaceous, the blades oval or elliptic-oblong, 15–22 cm. long, 6.5–11 cm. wide, abruptly cuspidate from the obtuse or rounded apex, obtuse to almost rounded at the base; inflorescence cymose-corymbose, sessile or pedunculate, 4.5–14 cm. long and broad, the flowers cymulose or subumbellate, on pedicels 1–5 mm. long; calyx truncate and distantly denticulate; corolla in bud 11–13 mm. long, the lobes equaling the tube; fruit depressed-globose, 7–10 mm. broad, bright blue.

Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26418, 26582*.—Loreto: Yurimaguas, in 1830, *Poeppig*. La Victoria on the Amazon, in forest, *Williams 2962*, type. Rancho Indiana, Distrito de Iquitos, 110 meters, overflowed creek bank, *Mexia 6318;* a shrub of 2 meters, the corolla blue.

Faramea subsessilis (R. & P.) Standl., comb. nov. *Coffea subsessilis* R. & P. Fl. 2: 64. *pl. 215, f. b*. 1799.

A glabrous shrub 3.5 meters high; stipules connate, acuminate; leaves subsessile, obovate-oblong, acuminate, coriaceous, subcordate at the base, shining above, very conspicuously veined; inflorescence much branched, many-flowered, the flowers ternate, long-pedicellate; fruit oval, red, turning dark violet, as large as a cherry.

Huánuco: Type from forests of Chinchao, *Ruiz & Pavón*.

I have seen no material representing this species, but the original illustration seems to show a plant almost certainly referable to the genus *Faramea*.

66. PAGAMEA Aubl.

Trees or shrubs; stipules connate into a sheath, deciduous; leaves opposite, petiolate, coriaceous; flowers small, glomerate, the clusters arranged in spikes or racemes or thyrsiform panicles, chiefly 4-parted; calyx tubular-campanulate, persistent, dentate; corolla funnelform, the tube very short, the lobes spreading, paleaceous-villous within, valvate in bud; anthers subsessile, linear, semiexserted; ovary almost free, 2–5-celled, the ovules solitary; fruit drupaceous, some of the cells often abortive.

Pagamea guianensis Aubl. Pl. Guian. 1: 113. 1775. *Psychotria Macbridei* Standl. Field Mus. Bot. 8: 68. 1930.

A shrub 1.5–2.5 meters high, densely leafy; stipules 8–10 mm. long, subulate-acuminate, brown; leaves on stout petioles, coriaceous, the blades usually fuscous when dried, obovate-oblong or elliptic-oblong, 5–11 cm. long, long-acuminate, narrowed toward the base and long-decurrent, paler beneath, sparsely pilose or almost glabrous except for tufts of hairs in the axils of the nerves; inflorescence simple or branched, densely many-flowered; calyx 1 mm. long, the teeth acute or obtuse; corolla white, 5 mm. long, glabrous outside; fruit subglobose, glabrous, usually 2-celled, black at maturity.

Junín: La Merced, 1,200 meters, in forest, *5785*, type of *Psychotria Macbridei*.—Loreto(?): Cerro de Isco, Río Huallaga, *Ule 64*.—Without locality: *Poeppig 2984*. Brazil and the Guianas.

Although referred by most recent authors to the Rubiaceae, this genus has been placed more often, perhaps, in the Loganiaceae, and it is probable that it should be removed permanently from the Rubiaceae.

67. STACHYOCOCCUS Standl., gen. nov.

Frutices, ramis crassiusculis obtuse tetragonis; folia ampla opposita breviter petiolata chartacea vel subcoriacea; inflorescentia terminalis spicata elongata, floribus bracteatis in glomerulos dense multifloros remotos dispositis, arcte sessilibus, hermaphroditis, paribus glomerulorum bractea breviter vaginante patelliformi subtectis; hypanthium minutum, calyce campanulato obsolete denticulato; corolla alba in alabastro obtusa extus minute puberulo-tomentella, tubo cylindraceo intus glabro, lobis in alabastro valvatis obtusis apice subcucullatis; stamina prope basin tubi inserta, filamentis brevibus filiformibus glabris, antheris dorsifixis oblongo-linearibus; ovarium biloculare, loculis 1-ovulatis, ovulis basi loculorum fixis erectis; fructus baccatus, pyrenis 2 non connatis; semina copiose albuminosa facie ventrali profunde anguste sulcata.

Type species, *Stachyococcus adinanthus* Standl.

Stachyococcus adinanthus Standl., comb. nov. *Retiniphyllum adinanthum* Standl. Field Mus. Bot. 8: 355. 1931.

A shrub 3–4.5 meters high, the branches glabrous; stipules unknown; leaves short-petiolate, the blades oblong-elliptic or oblanceolate-oblong, as much as 27 cm. long and 11.5 cm. wide but mostly narrower, somewhat rounded at the apex and abruptly

cuspidate-acuminate, acute at the base, glabrous, paler beneath, the nerves about 12 on each side; spikes about 13 cm. long and 12 mm. thick, the rachis minutely puberulent; calyx 2.2 mm. long, minutely puberulent; corolla obtuse in bud, the tube 4.5 mm. long, the 5 lobes spreading, narrowly oblong, obtuse, 3.5 mm. long.

Loreto: Mishuyacu, near Iquitos, in clearing, 100 meters, *Klug 988*, type.—Brazil: Igarapé das Pedras, Rio Tapajoz, State of Pará, *Ducke 23125* (Jard. Bot. Rio de Janeiro). Near mouth of Rio Embira, Amazonas, *Krukoff 4900, 4682*.

When this plant was first described by the writer, only flowering specimens were available for study, and it was impossible to do better than refer it to *Retiniphyllum*, a group with which actually it has no affinities. The fruiting specimens collected by Krukoff show that it is referable without question to the tribe Psychotrieae. The fruit is strikingly like that of coffee in general appearance, but the plant's relationship is with the genus *Psychotria*. That is so vast a group, with such a wide range of characters, that it is difficult to assign distinctive characters to *Stachyococcus*. However, in its general appearance *Stachyococcus* bears no close resemblance to any species of *Psychotria* with which I am familiar, the form of the inflorescence alone being sufficient to distinguish it, and I suspect that the differences between the two genera are important ones.

68. GEOPHILA Don

Creeping herbs; leaves long-petiolate, ovate-cordate or rounded-cordate, herbaceous; flowers small, in terminal, pedunculate, few-flowered heads, the heads subtended by 2 free bracts; calyx dentate or lobate; corolla tubular-funnelform, pilose in the throat; stamens 4–7, inserted in the corolla tube, the filaments filiform; ovary 2-celled; fruit fleshy, drupaceous, the 2 nutlets plano-convex, dorsally compressed, usually costate.

Ovary densely villous. Leaves acute, villous-hirsute on both surfaces.....*G. trichogyne.*

Ovary glabrous or nearly so.

Leaves broadly rounded or very obtuse at the apex, glabrous except beneath along the costa.....*G. herbacea.*

Leaves acute or acuminate.

Leaf blades glabrous.....*G. macropoda.*

Leaf blades pilose on the upper surface.....*G. gracilis.*

Geophila gracilis (R. & P.) DC. Prodr. 4: 537. 1830. *Psychotria gracilis* R. & P. Fl. 2: 63. *pl. 211, f. c.* 1799.

Stems very slender; stipules ovate, acute; leaves long-petiolate, the blades ovate-cordate, mostly 2–3 cm. long, acute or acuminate, thin, glabrous beneath; heads 6–9-flowered, the flowers short-pedicellate; calyx lobes linear-lanceolate; corolla pale violet; fruit ovate, blackish or red.

Huánuco: Type from Pillao and Pueblo Nuevo, *Ruiz & Pavón* (photo. seen, ex hb. Berol.).—Loreto: Yurimaguas, *Ule 6762.*—San Martín: Tocache, *Poeppig 1870.* Also in Brazil.

It is questionable whether this is more than a form of *G. herbacea.*

Geophila herbacea (Jacq.) Schum. in E. & P. Nat. Pfl. 4, pt. 4: 119. 1891. *Psychotria herbacea* Jacq. Enum. Pl. Carib. 16. 1760. *Mapouria herbacea* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 427. 1881.

A slender, creeping perennial; stipules 1.5 mm. long, obtuse; leaves long-petiolate, the blades rounded-ovate or subreniform, deeply cordate at the base, usually 3–4 cm. long, nearly glabrous; heads long-pedunculate, usually 3–5-flowered; calyx lobes lanceolate, acuminate; corolla white or purplish, often 1 cm. long; fruit red or almost black, 5 mm. long, usually spirally twisted.

Amazonas: Boca de Yarina, *Tessmann 3496.*—Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 22902.*—Junín: La Merced, 600 meters, in forest, *5273, 5502.* Chanchamayo Valley, 1,200 meters, *Schunke 355.*—Loreto: La Victoria, on the Amazon, in pasture, *Williams 2657, 2860.* Forest between Río Nanay and Río Napo, *Williams 688.* Puerto Arturo, along paths and in fields, *Williams 5178, 5324; Killip & Smith 27758.* Santa Rosa, in pasture, *Williams 4806.* Iquitos, in forest, *Williams 8048; Killip & Smith 27404.* Mishuyacu, in clearing, *Klug 492, 1147.* San Antonio, Río Itaya, 110 meters, *Killip & Smith 29499.* —San Martín: Tarapoto, *Williams 6009.* Generally distributed in tropical America, usually at low elevations; often a weed in cultivated ground.

Geophila macropoda (R. & P.) DC. Prodr. 4: 537. 1830. *Psychotria macropoda* R. & P. Fl. 2: 63. *pl. 211, f. b.* 1799. *P. cordifolia* Dietr. Gaertn. Lex. 1: 618. 1802–1810. *Coccocypselum macropodum* Britton, Bull. Torrey Club 18: 107. 1891.

A nearly glabrous, creeping herb; stipules ovate; leaf blades broadly cordate-ovate, acute; petioles at first pubescent; heads

3–6-flowered, the flowers subsessile; calyx lobes subulate; fruit oval, purplish black, the nutlets smooth.

Huánuco: Type from forests of Iscutuna, near Pillao, *Ruiz & Pavón.*

I have seen no material of this species, which probably is only a form of *G. herbacea.*

Geophila trichogyne (Muell. Arg.) Standl. Field Mus. Bot. 7: 423. 1931. *Mapouria trichogyne* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 426. 1881.

A large, creeping herb, copiously villous-hirsute throughout with long, slender, spreading hairs; leaves long-petiolate, the blades oblong-cordate to broadly ovate-cordate, 3–11 cm. long, acuminate to acutish, deeply cordate at the base, paler beneath; peduncles usually shorter than the petioles, 5–8-flowered; calyx lobes lance-linear; corolla white; fruit red or orange-red.

Junín: Cahuapanas, 340 meters, dense forest, *Killip & Smith 26780.*—Loreto: Caballo-cocha, on the Amazon, in forest, *Williams 2110.* La Victoria, on the Amazon, edge of forest, *Williams 2909.* Fortaleza, Yurimaguas, in forest, *Williams 4246.* Pisco, Alto Río Nanay, *Williams 1285.* Yurimaguas, *Ule 6763.* Mishuyacu, 100 meters, *Klug 1423.*—Without locality: *Poeppig 2242.* Also in Amazonian Brazil and in Venezuela and Colombia.

69. CEPHAELIS Sw.

Shrubs or small trees, sometimes herbs; stipules free or connate, usually persistent; leaves opposite; flowers capitate, subtended by an involucre of usually sessile, free or connate, often colored bracts, the heads terminal or axillary, simple or branched; calyx short or elongate, 4–7-dentate, persistent; corolla funnelform or salverform, the tube straight, commonly elongate, the throat villous or naked, the lobes 4–5, valvate in bud; stamens inserted in the throat of the corolla, the filaments usually short, the linear anthers included or exserted; ovary normally 2-celled; fruit drupaceous, containing 2 hard, smooth or costate nutlets, these usually longitudinally sulcate on the inner face.

The genus is scarcely a natural one, there being no sharp line of demarcation between it and *Psychotria.* For the most part, however, it is possible to refer a species readily to one or the other group, and since both genera are large ones, it seems desirable to recognize *Cephaelis* as distinct, merely as a matter of convenience.

Flower heads compound or simple and umbellate; bracts subtending the inflorescence broad.

Leaves densely pubescent beneath.....*C. Schunkeana.*

Leaves glabrous beneath except sometimes on the costa.

Leaf blades membranaceous, purple beneath when dry, mostly 9–11 cm. wide.....*C. pebasensis.*

Leaf blades thick-coriaceous, not purplish beneath, mostly 6 cm. wide or less.

Inflorescence trichotomous, the bracts at its base 1.5 cm. long.....*C. Schraderoides.*

Inflorescence of 4–5 umbellate heads, the bracts short and inconspicuous.....*C. umbellata.*

Flower heads simple, solitary, the bracts at their base sometimes linear.

Bracts subtending the heads linear or lance-linear. Plants with sparse or dense, spreading pubescence.

Leaves glabrous beneath or nearly so, ciliate, often hirsute on the costa.....*C. blepharophylla.*

Leaves copiously hirsute or pilose beneath.

Flower heads sessile.....*C. iodotricha.*

Flower heads short-pedunculate.....*C. trichocephala.*

Bracts subtending the heads chiefly ovate or broader.

Flower heads axillary, sessile or practically so.....*C. leucantha.*

Flower heads terminal or, if axillary, conspicuously pedunculate.

Flower heads small, in flower less than 1.5 cm. broad, commonly about 1 cm. broad; leaves glabrous or practically so.

Leaf blades oblong-linear to linear-lanceolate, 7–17 mm. wide.....*C. Oleandrella.*

Leaf blades oblong to elliptic-oblong, chiefly 2–6 cm. wide.

Stipules deeply bilobate, with subulate lobes.*C. Killipii.*

Stipules not bilobate.

Heads in flower 6–7 mm. wide, much longer than broad, slender-pedunculate; petioles 7–10 mm. long.....*C. Williamsii.*

Heads in flower 1 cm. wide or larger, nearly or quite as broad as long, on thick, stout peduncles; petioles chiefly 15 mm. long or more.....*C. flaviflora.*

Flower heads large, usually much more than 2 cm. wide; leaves often copiously pubescent.

Leaves purple or purplish beneath.....*C. oinochrophylla.*

Leaves green beneath.

Stipules neither bilobate nor biaristate. Leaves glabrous.

Bracts subtending the flower head 3–4 cm. long. *C. dolichophylla.*

Bracts about 1 cm. long.....*C. affinis.*

Stipules deeply bilobate or at least biaristate.

Stipules ovate, 6–7 mm. long, shortly biaristate at the apex or truncate and biaristate.

Bracts violaceous, 14–16 mm. long...*C. acreana.*

Bracts green, 20–25 mm. long.....*C. bella.*

Stipules deeply bilobate, 1–1.5 cm. long or larger.

Bracts free or nearly so.

Bracts dark red, usually broader than long. *C. rosea.*

Bracts whitish, longer than broad..*C. pubescens.*

Bracts long-connate.

Hairs along the costa on the lower surface of the leaf appressed.....*C. barcellana.*

Hairs of the costa spreading.....*C. tomentosa.*

Cephaelis acreana Krause, Notizbl. Bot. Gart. Berlin 6: 211. 1914.

A shrub, the branches glabrous; stipules ovate, biaristate; leaves short-petiolate, firm-membranaceous, the blades lanceolate to ovate-oblong, 9–12 cm. long, about 4 cm. wide, long-acuminate, acute at the base, glabrous or almost so; flower heads terminal, on rather short peduncles; bracts rounded-ovate, short-acuminate, 14–16 mm. long, violaceous when dry; corolla yellowish white, the tube 8 mm. long; fruit blue, costate, 5–6 mm. long. Neg. 713.

Loreto: Seringal Auristella, Alto Río Acre, *Ule 9856*, type (photo. and fragm. seen, ex hb. Berol.).

Cephaelis affinis Standl. Field Mus. Bot. 8: 184. 1930.

A glabrous shrub 1–2 meters high; leaves long-petiolate, the blades thick, oblong-elliptic, 19–30 cm. long, 8.5–14 cm. wide, abruptly acuminate, acute at the base; heads terminal, long-pedun-

culate, 2.5 cm. broad in fruit; bracts green, 8 mm. long and 12 mm. wide, broadly rounded at the apex; fruits pedicellate, subglobose, 8–9 mm. long, deep purple, the nutlets costate dorsally.

Loreto: Between Yurimaguas and Balsapuerto, dense forest, *Killip & Smith 28329*, type.

Cephaelis barcellana (Muell. Arg.) Standl. Field Mus. Bot. 8: 184. 1930. *Psychotria barcellana* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 369. 1881.

A shrub 1–2 meters high, or often chiefly herbaceous, the branches hirsute; leaves short-petiolate, membranaceous, the blades oblong-elliptic to lanceolate, long-acuminate, acute at the base; heads terminal, solitary, on short or elongate peduncles; bracts bright purplish red, 3–5 cm. long, acute or acuminate, sometimes with green tips, connate, saccate at the base; corollas yellow, sericeous; fruits bright blue.

Loreto: Lower Río Nanay, *Williams 341, 682, 714.* Marana, *Williams 1381.* Pinto-cocha, *Williams 782.* Caballo-cocha, in forest, *Williams 2323, 2069.* Pebas, *Williams 1690, 1683, 1692, 1624.* Florida, 180 meters, in forest, *Klug 2227.* Punchana, *Williams 1326, 1329.* Tira Doble, edge of stream, *Williams 1075.* Masisea, Río Ucayali, *Tessmann.* Iquitos, edge of forest, *Williams 3685;* in forest or clearings, *Killip & Smith 26970, 27377, 26931.* Ranging to Brazil, Venezuela, and Colombia. "Usiya-puiño" (Huitoto name).

"Awa," "picho sisa." In general appearance the plant is exactly like *C. tomentosa,* of which it may be only a form or variety. The only important differences between the two species are in the nature of the pubescence. Employed, according to Klug, "as a remedy for burns."

Cephaelis bella Standl. Field Mus. Bot. 8: 372. 1931.

A glabrous shrub with slender branches; stipules 2–2.5 mm. long; leaves petiolate, bright green, firm-membranaceous, the blades elliptic to ovate-elliptic or oblong-elliptic, 9.5–13.5 cm. long, acute, at the base acute or acuminate; heads terminal, short-pedunculate; bracts ovate-orbicular, green, acute or rounded and mucronate, broadly rounded or truncate at the base; calyx obscurely denticulate; corolla glabrous, the tube 9–13 mm. long.

Loreto: Puerto Arturo, Yurimaguas, in forest, *Williams 5207* (type), *5071.*

Noteworthy for the bright green color of dried specimens and for the large, green bracts.

Cephaelis blepharophylla Standl. Field Mus. Bot. 8: 182. 1930.

An herb or shrub 30–50 cm. high, erect or decumbent and rooting at the lower nodes, the stems sparsely villous-pilose or glabrate; stipule sheath truncate, the lobes linear-attenuate, 4–10 mm. long, ciliate; leaves petiolate, the blades elliptic-oblong to broadly elliptic, 7–15 cm. long, 2.5–7 cm. wide, abruptly acuminate, acute or abruptly decurrent at the base, long-ciliate; inflorescences terminal, capitate or densely cymose, the peduncles 5–10 mm. long, the heads 1.5–3 cm. broad; bracts parted almost to the base into linear, villous-ciliate segments; calyx minutely denticulate; corolla yellowish lilac, almost glabrous, the slender tube 13 mm. long, not barbate in the throat; fruit blue, subglobose, 5 mm. long, glabrous.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 59*. Soledad, Río Itaya, 110 meters, dense forest, *Killip & Smith 29798*. Also in Amazonian Brazil.

Cephaelis dolichophylla Standl. Field Mus. Bot. 4: 334. 1929.

A shrub with thick branchlets; stipules ovate-triangular, acuminate, 2 cm. long; leaves short-petiolate, the blades thick, oblanceolate-oblong to elliptic-oblong, 22–30 cm. long or larger, 4.5–15 cm. wide, long-acuminate or abruptly short-acuminate, attenuate to the base, glabrous; heads terminal, long-pedunculate, densely many-flowered; outer bracts broadly ovate, 3–4 cm. long, short-connate, acute, pink or deep red; fruit black, 5–7 mm. long or larger; calyx truncate.

Loreto: Near Yurimaguas, *Spruce 3876*, type; 135 meters, in dense forest, *Killip & Smith 28027*. Also in Matto Grosso, Brazil.

Cephaelis flaviflora (Krause) Standl. Field Mus. Bot. 8: 184. 1930. *Uragoga flaviflora* Krause, Bot. Jahrb. 40: 344. 1908.

A glabrous shrub or tree 2.5–6 meters high with rather slender branches; stipules broadly ovate, connate, 5–6 mm. long, obtuse or emarginate, persistent; leaves petiolate, coriaceous, the blades narrowly oblong to elliptic-obovate, 12–17 cm. long, caudate-acuminate, acute to attenuate at the base, with numerous lateral nerves; heads terminal, on short or elongate, stout peduncles; bracts yellow or orange, 8–10 mm. long, rounded at the apex or sometimes acutish; calyx obsoletely dentate; corolla yellow or pale yellow, glabrous,

16–18 mm. long, sometimes white; fruit brownish red; fruiting heads as much as 2.5 cm. broad. Neg. 742.

Huánuco: Between Monzón and Huallaga, 700 meters, *Weberbauer 3686*, type (photo. and fragm. seen, ex hb. Berol.).—Junín: Santa Rosa, 625–900 meters, dense forest, *Killip & Smith 26180, 26186*. San Nicolás, 1,100 meters, dense forest, *Killip & Smith 26002, 25982*.—Loreto: Below Pongo de Manseriche, 155 meters, *Tessmann 3887*. Pumayacu, 600–1,200 meters, *Klug 3147*.

Cephaelis iodotricha (Muell. Arg.) Standl. Field Mus. Bot. 7: 427. 1931. *Psychotria iodotricha* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 375. 1881.

A shrub 1–3.5 meters high, or sometimes merely herbaceous or suffrutescent, the branches hirsute with bluish hairs; stipules 4 mm. long, bifid; leaves subsessile, lance-oblong to ovate-oblong, 5–12 cm. long, long-acuminate, obtuse to rounded at the base; heads chiefly terminal, about 5-flowered; bracts deeply 5–8-fid, the segments setaceous-attenuate, hirsute with long, purplish hairs; calyx setaceous-laciniate like the bracts; corolla greenish white, hirsute. Neg. 22834.

Loreto: Lower Río Nanay, in forest, *Williams 712*. La Victoria, in forest, *Williams 2716, 2994*. Caballo-cocha, in forest, *Williams 2352*. Pebas, *Williams 1703, 1687, 1630*. Between Yurimaguas and Balsapuerto, 140 meters, dense forest, *Killip & Smith 28697*. Also along the Amazon in Brazil and in French Guiana.

Cephaelis Killipii Standl. Field Mus. Bot. 8: 187. 1930.

A shrub 1–3.5 meters high, glabrous except about the inflorescence; stipules 4 mm. long, bilobate to the middle; leaves short-petiolate, the blades oblong to obovate-oblong, 9–18 cm. long, abruptly acuminate, acute or attenuate at the base; heads terminal, on peduncles 1.2–2 cm. long, few-flowered, the outer bracts broadly ovate, 8 mm. long, abruptly long-acuminate, green, ciliate; calyx tubular, 4 mm. long, 5-fid; fruit red, subglobose, 8–9 mm. long, the nutlets almost smooth dorsally.

Loreto: San Antonio, on Río Itaya, 110 meters, dense forest, *Killip & Smith 29303* (type), *29425*. Soledad, *Killip & Smith 29624*. San Antonio, Alto Itaya, *Williams 3477, 3394*.

Cephaelis leucantha (Krause) Standl. Field Mus. Bot. 11: 191. 1936. *Uragoga leucantha* Krause, Bot. Jahrb. 40: 345. 1908.

A shrub 2.5 meters high, or sometimes lower and herbaceous or suffrutescent, the stems glabrous; stipules connate into a truncate sheath 3–4 mm. long; leaves rather short-petiolate, the blades elliptic-obovate to oblanceolate-oblong, 20–30 cm. long, 6–12 cm. wide, acute or short-acuminate, acute or attenuate at the base, sparsely pilose beneath or glabrate, thin; heads axillary, sessile or short-pedunculate, the bracts broadly ovate, acutish, glabrous; calyx 5-dentate; corolla white, glabrous, 6–7 mm. long. Neg. 754.

Huánuco: Between Monzón and Huallaga, 600 meters, *Weberbauer 3668*, type (photo. and fragm. seen, ex hb. Berol.).—Junín: Cahuapanas, 340 meters, dense forest, *Killip & Smith 26759*.—Loreto: San Antonio, Río Itaya, 110 meters, dense forest, *Killip & Smith 29527, 29362*. Mouth of Río Santiago, upper Marañón, 160 meters, upland forest, *Tessmann 4093, 4330*.

The plant should probably be referred rather to the genus *Psychotria*.

Cephaelis oinochrophylla Standl. Field Mus. Bot. 8: 372. 1931.

A shrub 1.5 meters high, branched, the branches glabrous; stipules broadly ovate, 1–1.5 cm. long, abruptly acuminate, glabrous, short-bifid at the apex; leaves short-petiolate, the blades elliptic-oblong, 15–20 cm. long, 4.5–7.5 cm. wide, short-acuminate, acute at the base, glabrous above, beneath red-purple in the dried state, minutely puberulent on the costa, elsewhere glabrous; inflorescence terminal, long-pedunculate, composed of 3 dense, sessile or very shortly pedunculate heads, the outer bracts rounded, 10–12 mm. long, broadly rounded or apiculate at the apex; corolla tube 8–9 mm. long, the lobes 1 mm. long.

Loreto: Tierra Blanca, lower Río Morona, middle Marañón, 160 meters, in forest, *Tessmann, 4913*, type.

The collector supplies the following notes: Bracts more or less deep brownish lilac; peduncles often almost wholly lilac; lower leaf surface colored a beautiful lilac; corolla white. The species may be recognized at once by the brightly colored under surface of the leaf blades.

Cephaelis Oleandrella Standl. Field Mus. Bot. 4: 334. 1929.

A shrub 1–3.5 meters high, glabrous almost throughout, with slender branches; stipule sheath 1–3 mm. long, the subulate lobes 1–2 mm. long; leaves short-petiolate, the blades 4–8.5 cm. long, narrowly long-acuminate, the costa beneath bordered by a ribbon-like, ciliate membrane; heads long-pedunculate, terminal, 7–9 mm.

wide; outer bracts broadly ovate, 6–7 mm. long, acuminate, ochroleucous, ciliolate; calyx 5-lobate; corolla ochroleucous, glabrous, 9 mm. long; fruit orange or red.

Junín: La Merced, 1,200 meters, on montaña slope, *Macbride 5635*, type. Above San Ramón, 1,300–1,700 meters, *Schunke A30; Killip & Smith 24606*. Dos de Mayo, 1,800 meters, dense forest, *Killip & Smith 25816*. Yapas, 1,500 meters, dense forest, *Killip & Smith 25491*. Chanchamayo Valley, *Schunke 410*.

Cephaelis pebasensis Standl. Field Mus. Bot. 8: 186. 1930.

A shrub with stout, glabrate branches; stipules persistent, 1.5 cm. long, bilobate, the lobes semiovate, acutish; leaves petiolate, chartaceous, the blades oblong-elliptic, 14–26 cm. long, 5–11 cm. wide, abruptly short-acuminate, abruptly decurrent at the base, glabrous above, sparsely pilosulous beneath along the costa; inflorescence terminal, short-pedunculate, composed of 3–5 umbellate or short-racemose heads, the basal bracts broadly ovate, obtuse, 1–1.5 cm. long, the heads 1.5 cm. in diameter; calyx 2–3 mm. long, 5-fid; fruit oblong, 5–6 mm. long, sparsely pilosulous.

Loreto: Pebas, on the Amazon, in forest, *Williams 1786* (type), *1657*.

Cephaelis pubescens Hoffmannsegg ex R. & S. Syst. Veg. 5: 213. 1819.

A more or less branched shrub; leaves large, thin, narrowly lanceolate or oblong-lanceolate, acuminate or long-attenuate, acute to attenuate at the base, pubescent, especially on the upper surface, short-petiolate; heads very large, terminal, long-pedunculate, the outer bracts cordate-ovate or lance-ovate, long-acuminate, usually pale and whitish near the base, sometimes purple-red, acute to long-acuminate; corolla 5 mm. long; fruit blue, 3 mm. long. Neg. 764.

Loreto: Florida, Río Putumayo, 200 meters, in forest, *Klug 2038*. Colombia, the Guianas, and northern Brazil.

Cephaelis rosea Benth. in Hook. Journ. Bot. 3: 224. 1841. *Psychotria rosea* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 360. 1881.

A nearly glabrous shrub; stipules deeply bifid, with linear-attenuate lobes; leaves petiolate, the blades ovate-lanceolate to elliptic-oblong, 12–20 cm. long, long-acuminate, acute or attenuate at the base; heads terminal, rather short-pedunculate, 2.5–3.5 cm. wide, the outer bracts often broader than long, cordate-ovate,

acute or obtuse, green or purplish; calyx 5-fid; corolla nearly glabrous, 7 mm. long or larger. "Yaku-sisa blanca," "sufia."

Loreto: Río Nanay, in forest, *Williams 765*. Timbuchi, Alto Nanay, *Williams 997*. Also in Brazil, Venezuela, and the Guianas.

Cephaelis Schraderoides (Krause) Standl. Field Mus. Bot. 11: 191. 1936. *Uragoga Schraderoides* Krause, Bot. Jahrb. 40: 344. 1908.

A glabrous shrub 2 meters high; stipules connate into a sheath 4–5 mm. long, bifid at the apex; leaves short-petiolate, oblong or obovate-oblong, 8–13 cm. long, 3.5–5.5 cm. wide, coriaceous, acute or acuminate, acute at the base; inflorescence terminal, consisting of 3 pedunculate heads; bracts narrowly ovate, acute; calyx lobes ovate-triangular; corolla white, its tube 6–8 mm. long. Neg. 767.

Loreto: Mountains east of Moyobamba, 1,500 meters, *Weberbauer 4750*, type (photo. and fragm. seen, ex hb. Berol.).

Cephaelis Schunkeana Standl. Field Mus. Bot. 8: 185. 1930.

A shrub 2.5–3.5 meters high, the stout branchlets pilose or glabrate; stipule lobes semiovate, 1 cm. long; leaves long-petiolate, the blades firm-membranaceous, elliptic, 27–32 cm. long, 14–15 cm. wide, abruptly acuminate, acute at the base or abruptly contracted, glabrous above, velutinous-pilosulous beneath; inflorescence terminal, pedunculate, composed of 7 racemosely disposed heads 1–2 cm. long; basal bracts broadly ovate, green, obtuse, 1.5 cm. long; calyx tubular, 4 mm. long or more, glabrous; fruit subglobose, glabrous, 12 cm. long.

Junín: Schunke Hacienda, above San Ramón, 1,400–1,700 meters, dense forest, *Killip & Smith 24658*, type.

Cephaelis tomentosa (Aubl.) Vahl, Eclog. Amer. 1: 19. 1796. *Tapogomea tomentosa* Aubl. Pl. Guian. 1: 160. *pl. 61*. 1775. *Uragoga tomentosa* Kuntze, Rev. Gen. 1: 301. 1891.

A shrub 1–3 meters high, or sometimes chiefly herbaceous, copiously hirsute or pilose throughout; leaves thin, short-petiolate, the blades lanceolate to ovate-elliptic, large, long-acuminate, acute at the base; heads chiefly terminal, on long or short peduncles, dense and many-flowered, the bracts chiefly 3–5 cm. long, broadly ovate, long-connate above the base, deep red, acute or acuminate, sometimes with long, green tips; corollas yellow; fruit blue. Neg. 772.

Cuzco: Marcapata Valley, 1,200 meters, *Herrera 1156*.—Junín: La Merced, 600 meters, montaña slopes, *5530*. Santa Rosa, 625–900 meters, *Killip & Smith 26159*. Colonia Perené, 680 meters,

dense forest, *Killip & Smith 24947*. Above San Ramón, 1,400–1,700 meters, *Killip & Smith 24583*. San Ramón, 900–1,300 meters, edge of woods, *Killip & Smith 24750*. Near La Merced, *Killip & Smith 23847*. Yapas, 1,400 meters, *Killip & Smith 25556*. Puerto Yessup, 400 meters, dense forest, *Killip & Smith 26227*. Chanchamayo Valley, 1,500 meters, *Schunke 449, 242*.—Loreto: Paltacocha, Río Nanay, in forest, *Williams 1258*. Between Yurimaguas and Balsapuerto, 140 meters, *Killip & Smith 28239*. La Victoria, *Williams 2964*. Iquitos, *Williams 3656, 3655, 3654, 3764, 3688*.—San Martín: Tarapoto, *Williams 5640, 5975*. Lamas, *Williams 6399*. San Roque, 1,400 meters, *Williams 7496, 7107*. Ranging from Bolivia and Brazil to southern Mexico.

A handsome plant because of the large flower heads with their bright red bracts, yellow corollas, and blue berries. The plant is common in the lowlands of many parts of tropical America.

Cephaelis trichocephala (P. & E.) Standl. Field Mus. Bot. 8: 375. 1931. *Psychotria trichocephala* P. & E. Nov. Gen. & Sp. 3: 32. *pl. 238*. 1845. *Uragoga trichocephala* Kuntze, Rev. Gen. 1: 301. 1891.

A low or tall shrub, the branches shortly villous-hirsute; leaves short-petiolate, the blades oblong or lance-oblong, 5–15 cm. long, acuminate, acute to obtuse at the base, sparsely villous above, rather densely pilose beneath with short, soft hairs; inflorescences terminal, solitary, head-like, sometimes trichotomous, the bracts setaceous, hirsute-ciliate; calyx 5-dentate; corolla violaceous and yellow, pilose; fruit dark violet. Neg. 775.

San Martín: Type from Río Tocache, *Poeppig 2039* (photo. seen, ex hb. Berol.). Tarapoto, 750 meters, *Williams 5979*.—Loreto: Pumayacu, 600–1,200 meters, in forest, *Klug 3241;* a shrub of 1 meter, the flowers white and red-violet.

Cephaelis umbellata (R. & P.) Standl. Field Mus. Bot. 7: 301. 1931. *Coffea umbellata* R. & P. Fl. 2: 64. *pl. 215, f. a*. 1799. *C. Conephoroides* Rusby, Bull. N. Y. Bot. Gard. 4: 372. 1907. *Uragoga Weberbaueri* Krause, Bot. Jahrb. 40: 345. 1908.

A glabrous shrub or tree 5 meters high or less; stipules connate, 5–8 mm. long, rounded at the apex and bidentate; leaves coriaceous, short-petiolate, the blades obovate-oblong to elliptic-oblong, 10–18 cm. long, abruptly acuminate, acute or obtuse at the base, with numerous lateral nerves; flower heads umbellate at the end of a long terminal peduncle, the inflorescence violet; bracts 5–6 mm. long; fruit subglobose, 6 mm. long. Negs. 824, 845.

Huánuco: Described from Cochero and Chinchao, *Ruiz & Pavón* (photo. of authentic specimen seen, ex hb. Berol.).—Loreto: Type of *U. Weberbaueri* collected near Moyobamba, *Weberbauer 4540.* Also in Bolivia.

Casual reading of the descriptions of *Coffea umbellata* R. & P. and *C. subsessilis* R. & P. will show that the illustrations of the two are transposed in *plate 215. Figure a* is evidently the plant described as *Coffea umbellata,* and *figure b* is *Coffea subsessilis.* This confusion seems not to have been discovered by earlier writers.

I have seen no material of *Uragoga Weberbaueri,* but from the description it can not be separated from *Cephaelis umbellata.*

Cephaelis Williamsii Standl. Field Mus. Bot. 8: 185. 1930.

A glabrous shrub or small tree 2–4 meters high with slender branches; stipule sheath truncate, 1 mm. long; leaves slender-petiolate, the blades thick-membranaceous, elliptic-oblong, 5.5–10.5 cm. long, 2–4.5 cm. wide, caudate-acuminate, acute at the base; peduncles terminal or pseudo-axillary, 12–18 mm. long, the 2 basal bracts of the head cochleate, 1 cm. long, short-connate at the base; calyx minute, denticulate; corolla cream-colored; fruit oval-globose, 5–6 mm. long, obtusely costate.

Loreto: Manfinfa, Alto Río Nanay, in forest, *Williams 1114* (type), *1123.* Also in Colombia.

70. DECLIEUXIA HBK.

Perennial herbs or small shrubs, usually erect, usually turning black when dried; stipules subulate-linear, mucroniform, or obsolete, often decurrent; leaves opposite or verticillate, commonly sessile and small; flowers small, cymose, 4-parted; sepals free or nearly so and often distant; corolla funnelform, the lobes valvate; stamens inserted in the throat of the corolla; fruit didymous, indehiscent, 2-celled, with 1 seed in each cell, the cells laterally compressed.

Declieuxia peruviana Wernham, Journ. Bot. 52: 225. 1914.

Suffrutescent, virgately branched, the slender branchlets nearly glabrous; leaves linear, subcoriaceous, about 13 mm. long and 2 mm. wide, obtuse, sessile, glabrous, the margin revolute; stipules triangular, 2 mm. long, acute; inflorescence subcapitate, 1.5–2 cm. broad, the small flowers scarcely 5 mm. long, glabrous.

Amazonas: Type from Chachapoyas, *Mathews.* Known to the writer only from description.

71. RUDGEA Salisb.

Shrubs or small trees; stipules interpetiolar, bearing on the margins or at the apex or on the dorsal surface subulate or aculeoliform teeth, these commonly pale and somewhat cartilaginous, usually deciduous, the stipules sometimes laciniate; leaves opposite, short-petiolate or sessile, commonly more or less coriaceous; inflorescence terminal, paniculate, cymose, umbellate, or capitate, sometimes reduced to a single flower; calyx segments almost free or variously connate; corolla salverform or funnelform, the lobes valvate in bud; stamens inserted in the corolla tube; fruit baccate, containing 2 one-seeded nutlets.

Calyx enlarged and more or less corolla-like, 1.5–2 cm. long. *R. sororia.*

Calyx small and inconspicuous, usually less than 5 mm. long.

Flowers capitate or subcapitate, the heads sessile or stalked.

Heads long-pedunculate..... *R. retifolia.*

Heads sessile or nearly so.

Inflorescence not involucrate, not subtended by large stipules. *R. sessiliflora.*

Inflorescence subtended by large stipules or by foliaceous bracts.

Heads subtended by large, leafy bracts.... *R. justicioides.*

Heads subtended by large, pectinate-laciniate stipules. *R. cryptantha.*

Flowers not capitate, cymose, umbellate, or paniculate.

Stipules large, usually striate, deeply laciniate on the margins.

Leaves large, distinctly petiolate.

Inflorescence thyrsiform; lateral nerves of the leaves almost perpendicular to the costa..... *R. Woronowii.*

Inflorescence cymose-corymbose; nerves oblique.

Leaves conspicuously pilose beneath..... *R. Mexiae.*

Leaves glabrous.

Corolla tube very thick and stout..... *R. obesiflora.*

Corolla tube slender.

Stipules 8–11 mm. long..... *R. psychotriaefolia.*

Stipules 4–6 mm. long..... *R. amazonica.*

Stipules inconspicuous, comparatively small, neither striate nor with deeply laciniate margins.

Young branchlets densely pilosulous or hispidulous.
Leaf blades attenuate to the base..... *R. angustissima.*
Leaf blades obtuse or rounded at the base.
Corolla 5 mm. long or less; leaves sessile or subsessile. *R. hispidula.*
Corolla 2.5 cm. long or larger; leaves conspicuously petiolate..... *R. insolita.*
Young branchlets glabrous or finely puberulent.
Calyx 1 cm. wide, with deep, rounded lobes.. *R. ceriantha.*
Calyx less than 5 mm. wide, not with large, rounded lobes.
Calyx truncate or with scarcely perceptible, truncate or rounded lobes, about 4 mm. wide..... *R. loretensis.*
Calyx evidently dentate, usually much less than 4 mm. wide.
Leaves sessile or essentially so..... *R. Poeppigii.*
Leaves conspicuously petiolate.
Leaves large, chiefly 7.5–10 cm. wide.
Leaves excavate beneath in the axils of the nerves. *R. foveolata.*
Leaves not excavate beneath.
Inflorescence umbelliform, radiately branched. *R. Sprucei.*
Inflorescence racemiform, with chiefly opposite branches..... *R. racemosa.*
Leaves relatively small, commonly 3–7 cm. wide.
Leaf blades obtuse, subcoriaceous..... *R. nitida.*
Leaf blades acuminate or cuspidate.
Leaf blades rounded at the apex and abruptly contracted into an elongate, linear acumination..... *R. acuminata.*
Leaf blades gradually acuminate, or abruptly contracted into a triangular acumination.
Corolla and branches of the inflorescence pubescent.
Nerves of the leaves about 13 pairs. *R. microcarpa.*
Nerves of the leaves about 9 pairs. *R. stenophylla.*

Corolla and branches of the inflorescence glabrous.

Corolla about 8 cm. long..... *R. Klugii.*

Corolla much shorter.

Corolla 11–13 mm. long.

Leaves gradually long-acuminate. *R. tambillensis.*

Leaves rounded at the apex and abruptly short-acuminate. *R. verticillata.*

Corolla 7–8 mm. long.

Leaves firm-membranaceous; inflorescence short, about as broad as long; bracts small but conspicuous. *R. ciliata.*

Leaves coriaceous; inflorescence thyrsoid, narrow; bracts minute and obscure..... *R. canephorantha.*

The key presented above is, in large part, an altogether unsatisfactory one, but it is the best that can be made with the available material, which represents all the species listed. All or most of the species are, I believe, valid ones, but some are known only in fruit and others only in flower, consequently it is impossible to compare their corresponding characters.

Rudgea acuminata (R. & P.) Standl. Field Mus. Bot. 7: 327. 1931. *Coffea acuminata* R. & P. Fl. 2: 64. *pl. 214, f. b.* 1799.

A glabrous shrub 3.5 meters high; stipules ovate, acute, caducous; leaves slender-petiolate, the blades oval-oblong, about 10 cm. long and 4 cm. wide or larger, rounded and caudate at the apex, with a long, linear acumination, acute at the base, barbate beneath in the axils of the nerves; flowers in small, pedunculate, corymbiform panicles, subsessile; calyx dentate; corolla white; fruit oval, red, as large as a cherry. Neg. 801.

Huánuco: Type from forests of Chinchao, *Ruiz & Pavón* (photo. seen of an authentic specimen, ex hb. Berol.).

The Berlin specimen of which I have seen a photograph is in rather poor condition, with fruit only. It is not at all certain from examination that the plant is a *Rudgea*. At Berlin it has been placed in *Faramea*, but the fruit appears to be decidedly longer

than broad and, if that is the case, it is not a *Faramea*. Neither does it resemble a *Coussarea*.

Rudgea amazonica Muell. Arg. Flora 59: 449, 460. 1876; in Mart. Fl. Bras. 6, pt. 5: 170. *pl. 22, f. 2.* 1881.

A nearly or quite glabrous shrub about 3.5 meters high, with rather stout branches; stipules oblong-ovate, incised-lanciniate, deciduous; leaves short-petiolate, subcoriaceous, ovate or elliptic-oblong, 10–17 cm. long, acute or acuminate, acute at the base, the nerves 6–8 pairs; panicles open, few- or many-flowered, pedunculate, the flowers sessile or nearly so; corolla 7–8 mm. long; fruit ellipsoid, usually by abortion 1-seeded, 7–9 mm. long. Neg. 653.

Loreto: La Victoria on the Amazon, in forest, *Williams 2813*. Río Masana near Iquitos, *Williams 23*. Also in Amazonian Brazil and in Bolivia.

Rudgea angustissima Standl. Field Mus. Bot. 11: 259. 1936.

A slender shrub 3–3.5 meters high, the branchlets pilose with minute, spreading hairs; stipules 5–6 mm. long, deeply laciniate, the few lobes subulate; leaves short-petiolate, firm-membranaceous, the blades linear-oblong or narrowly linear-lanceolate, 9–11 cm. long, 15–18 mm. wide, long-attenuate, glabrous above, beneath sparsely and minutely puberulent or glabrate, more densely puberulent on the costa; inflorescence pedunculate, small and few-flowered, about 1 cm. long and broad, the bracts obscure, the flowers aggregate, sessile; hypanthium almost 1 mm. long, glabrate, the calyx minute, remotely repand-denticulate; corolla in immature buds glabrous.

Junín: Puerto Bermúdez, 375 meters, in dense forest, *Killip & Smith 26459*, type.

Rudgea canephorantha (Wernham) Standl. Field Mus. Bot. 11: 268. 1936. *Psychotria canephorantha* Wernham, Journ. Bot. 55: 338. 1917.

A shrub about 3 meters high, glabrous throughout; stipules short and in age indurate, at first bearing outside below the apex a row of short, thickened setae, these often deciduous; leaves short-petiolate, coriaceous, yellowish green, elliptic to oblong, mostly 9–13 cm. long, acute, obtuse or acute at the base, often lustrous; flowers sessile in small cymes, the cymes racemose and forming an often elongate, thyrsoid panicle, the bracts minute and obscure; calyx teeth broadly ovate, acute, short; corolla white, glabrous, 6–7 mm. long; fruit globose-oval, 6 mm. long.

San Martín: Near Tarapoto, *Spruce 4120*, type collection; *Ule 6554; Williams 5389, 5820, 6159, 6110, 6511*. Juan Guerra, *Williams 6872*. Juan Jui, 400 meters, in forest, *Klug 3764*.

Rudgea ceriantha Schum. Verh. Bot. Ver. Brandenb. 47: 190. 1905.

A shrub or tree 2–8 meters high with puberulent branches; stipules 12–20 mm. long, bifid, the lobes lanceolate, acuminate; leaves short-petiolate, the blades elliptic-oblong or oblong-obovate, 10–25 cm. long, 4–12 cm. wide, short-acuminate, acute or somewhat attenuate at the base, puberulent beneath; panicles corymbiform, sessile, the bracts ovate, the 5-parted flowers short-pedicellate; calyx lobes large, suborbicular, obtuse, ciliolate; corolla 32 mm. long, with short lobes. Neg. 657.

Loreto: Cerro de Escalera, 1,200 meters, *Ule 6677*, type (photo. seen, ex hb. Berol.).

Examination of a photograph of the type arouses much doubt in the writer's mind as to whether the plant is really a *Rudgea*. It is more likely to prove to be a *Psychotria*.

Rudgea ciliata (R. & P.) Spreng. Syst. Veg. 1: 755. 1825. *Coffea ciliata* R. & P. Fl. 2: 65. *pl. 216, f. a*. 1799.

A glabrous shrub 3–4 meters high; stipules truncate and at first subulate-ciliate; leaves short-petiolate, thin or subcoriaceous, the blades oblong to oval or obovate, 7–16 cm. long, abruptly acute or acuminate, acute at the base, paler beneath; inflorescence small, paniculate, corymbiform, with opposite or verticillate branches, the flowers sessile or short-pedicellate; calyx teeth minute, subulate; corolla white, 7 mm. long, the oblong lobes recurved, almost equaling the tube; stamens exserted; fruit globose, red, 5–6 mm. long. Neg. 658.

Huánuco: Described from Carpis and Pati, between Chinchao and Acomayo, *Ruiz & Pavón* (photo. of authentic specimen seen, ex hb. Berol.).—San Martín: San Roque, in forest, *Williams 7072, 7657*. Also in Bolivia.

Called "sauco del monte" in Bolivia.

Rudgea cryptantha Standl. Field Mus. Bot. 11: 260. 1936.

A glabrous shrub 2 meters high with slender branches; stipules conspicuous, 1–1.5 cm. long, elliptic, laciniate-dentate, persistent; leaves short-petiolate, membranaceous, the blades narrowly lanceolate or oblong-lanceolate, 9–13 cm. long, 1.5–4 cm. wide, narrowly

attenuate-acuminate, acute at the base; flowers few, white, in terminal, sessile clusters subtended by large, persistent stipules; corolla lobes scarcely half as long as the tube; stamens included.

Loreto: San Antonio, Alto Río Itaya, *Williams 3521*, type. Lower Río Nanay, in forest, *Williams, 707*. Above Pongo de Manseriche, *Mexia 6374*.

Rudgea foveolata (R. & P.) Zahlbr. Ann. Naturh. Hofmus. Wien 7: 2. 1892. *Coffea foveolata* R. & P. Fl. 2: 65. *pl. 216, f. b.* 1799.

A glabrous shrub 3.5 meters high, with rather stout branches; stipules semicircular, glanduliferous dorsally, short; leaves slender-petiolate, the blades elliptic or broadly elliptic, about 16 cm. long and 8.5 cm. wide, abruptly acuminate, obtuse or acutish at the base, excavate beneath in the axils of the nerves; panicles short-pedunculate, 6 cm. long, laxly many-flowered, the flowers sessile; calyx 5-dentate, the teeth acute; corolla white, purplish outside, 6–8 mm. long, with short lobes, the throat villous; stamens exserted; fruit small, globose, red. Neg. 661.

Huánuco: Described from Mesapata and Pueblo Nuevo, *Ruiz & Pavón* (photo. seen of authentic specimen, ex hb. Berol.).

Rudgea hispidula Standl. Field Mus. Bot. 8: 226. 1930.

A slender shrub 1.5 meters high or less, the branchlets densely hispidulous; stipules persistent, 1–4 mm. long, rounded and mucronate, bearing at first a dorsal cluster of pale setae; leaves subsessile, firm-membranaceous, the blades lance-oblong to elliptic, 6–11 cm. long, 2–5.5 cm. wide, obtusely acuminate, often emarginate or subcordate at the base, glabrous; inflorescences small, pedunculate, corymbiform, few-flowered, the branches sparsely pilose, the flowers sessile; calyx subtruncate; corolla white, sparsely and minutely puberulent, rounded at the apex in bud; fruit subglobose, about 5 mm. in diameter, white.

Loreto: Santa Rosa, lower Río Huallaga, 135 meters, in forest, *Killip & Smith 28931*, type; in or at edge of forest, *Williams 4753, 4863, 4870*. Yurimaguas, 135 meters, in forest, *Killip & Smith 27644, 27632; Williams 4663*. Puerto Arturo, *Williams 5050*.

Rudgea insolita Standl. Field Mus. Bot. 7: 153. 1930.

Branchlets densely pilosulous; stipules ovate-triangular, aculeolate-ciliate at the apex; leaves petiolate, the blades subcoriaceous, oval or broadly elliptic, 11–16 cm. long, 6–9 cm. wide, acute, rounded at the base, pilosulous on both sides along the costa; inflorescence

pedunculate, cymose-corymbose, densely many-flowered, trichotomous, the branches densely pilosulous, the flowers congested and sessile; calyx lobes oblong, recurved, 3–5 mm. long, obtuse; corolla densely hispidulous, the slender tube 23 mm. long or more, the oblong lobes 7–9 mm. long, obtuse, cucullate at the apex.

Huánuco: Cochero, in forest, *Poeppig 1091*.—Without locality: Peruvia subandina, *Poeppig* (hb. Berol.). Also in the mountains of Colombia.

Rudgea justicioides Standl. Field Mus. Bot. 8: 229. 1930.

A slender glabrous shrub 1.5–2 meters high; stipules 3.5–5 mm. long, bifid, subulate-ciliate on the basal part, persistent; leaves sessile or subsessile, firm-membranaceous, elliptic or oblong-elliptic to lance-oblong, 6.5–12.5 cm. long, 2.5–5.5 cm. wide, abruptly acuminate or acute, acute at the base or narrowed and obtuse; inflorescences terminal, capitate, short-pedunulate or subsessile, densely few-flowered, subtended by several broad, purple bracts 1.5–2 cm. long; calyx tubular, denticulate; corolla white; fruit deep blue, oval, 7–9 mm. long.

Loreto: Río Masana, *Williams 163*, type. San Antonio, *Williams 3433; Killip & Smith 29354, 29331*. Also in Amazonian Brazil.

Rudgea Klugii Standl., sp. nov.

Arbor 5-metralis omnino glabra, ramulis crassiusculis subteretibus, vetustioribus ochraceis, internodiis brevibus; stipulae deciduae, supremae 3 mm. longae rotundato-ovatae obtusae apice sparse breviter aculeolato-ciliatae; folia mediocria breviter petiolata subcoriacea in sicco fusca, petiolo crassiusculo 1–1.5 cm. longo; lamina ellipticooblonga 8–15 cm. longa 4–6.5 cm. lata abrupte acuminata vel apice subrotundata et abrupte in acumen angustum contracta, basi acuta, supra lucida nervis vix elevatis, subtus sublucida brunnescens, costa crassiuscula elevata, nervis lateralibus utroque latere circa 9 prominulis obliquis remote a margine arcuato-conjunctis, venulis inconspicuis; inflorescentia terminalis capitato-umbelliformis 3–5-flora breviter pedunculata vel fere sessilis, pedicellis crassis vix ultra 2 mm. longis; calyx circa 2 mm. longus profunde lobatus, laciniis ovatis acutis vel acuminatis; corolla alba extus glabra, tubo gracillimo 6 cm. longo vel paullo ultra 1.5 mm. crasso, lobis 5 oblongo-linearibus 1.5 cm. longis; antherae longe exsertae.

San Martín: Pongo de Cainarachi, Río Cainarachi, a tributary of the Río Huallaga, 230 meters, in forest, *Klug 2664* (herb. Field Mus. No. 675,993, type).

Noteworthy for its very large corollas and its few-flowered inflorescences.

Rudgea loretensis Standl. Field Mus. Bot. 8: 230. 1930.

A glabrous shrub 1–3 meters high (reported in Brazil as 6 meters high) with rather stout branches; stipules persistent, broadly ovate or rounded, 6–10 mm. long, obtuse, dorsally aculeolate-ciliate; leaves short-petiolate, thick-membranaceous, the blades broadly elliptic to lance-oblong, 11–20 cm. long, 4–11.5 cm. wide, long-acuminate, acute at the base, excavate beneath in the axils of the nerves; inflorescence cymose-paniculate, laxly few-flowered, 3–4.5 cm. long and broad, trichotomous at the base, the flowers sessile; corolla white, minutely pulverulent or glabrate, the tube 12 mm. long, the oblong, recurved lobes 7 mm. long.

Loreto: Caballo-cocha on the Amazon, in forest, *Williams 2484* (type), *2233*, *2505*. La Victoria, in forest, *Williams 2877*, *2618*, *2841*. Balsapuerto, 150–350 meters, dense forest, *Killip & Smith 28567*; *Klug 3057*. Iquitos, 100 meters, *Killip & Smith 27450*. Fortaleza, Yurimaguas, edge of forest, *Williams 4395*. Also in Amazonian Brazil.

Rudgea Mexiae Standl., sp. nov.

Arbuscula 5-metralis, ramulis crassis primum pilosis cito glabratis, internodiis brevibus; stipulae magnae 2 cm. longae et ultra dense pilosae fere ad basin in lacinias numerosas filiformes graciles fissae; folia magna papyracea breviter petiolata, petiolo crasso 3–4.5 cm. longo dense piloso; lamina elliptico-oblonga vel obovato-oblonga 25–32 cm. longa 9–12 cm. lata abrupte breviter acuminata, basi acuta vel acuminata, supra in sicco fusca glabra, nervis non elevatis, subtus multo pallidior ubique subdense breviter pilosa, ad costam densius longiusque pilosa, costa crassa elevata, nervis lateralibus utroque latere circa 14, aliis fere aequivalidis interjectis, angulo lato adscendentibus valde arcuatis prominentibus marginem attingentibus, venulis inconspicuis paucis; inflorescentia terminalis 12 cm. longe pedunculata capitato-corymbosa 5.5 cm. longa, bracteis magnis lanceolatis basi latis, ramis crassis sparse pilosis, floribus numerosissimis dense capitatis sessilibus, capitulis paucis vulgo ternatis crasse pedunculatis 1–1.5 cm. diam. bracteis erectis lanceolatis vel ovatis striatis attenuatis vel acuminatis pilosis fulcratis; corolla 12 mm. longa extus dense pilosa alba, lobis suberectis brevibus acutis.

Loreto: Above Pongo de Manseriche, at right of the mouth of Río Santiago, 210 meters, in dense forest, infrequent, *Ynes Mexia 6366* (herb. Field Mus. No. 718,409, type).

Rudgea microcarpa (R. & P.) Standl. Field Mus. Bot. 8: 382. 1931. *Coffea microcarpa* R. & P. Fl. 2: 66. *pl. 218, f. b.* 1799.

A glabrous shrub or small tree 5 meters high; stipules connate, truncate and bidentate, with subulate teeth; leaves short-petiolate, the blades large, lance-oblong to elliptic-lanceolate, long-acuminate, acute or attenuate at the base; inflorescence pedunculate, paniculate, corymbiform, laxly many-flowered, the flowers sessile, ternate, the branches minutely pubescent; calyx minute, 5-dentate; corolla whitish, finely pubescent; anthers scarcely exserted; fruit reddish, globose, the size of a peppercorn. Neg. 679.

Huánuco: Type from forests of Pillao near Patasaria, *Ruiz & Pavón* (photo. and fragm. seen of authentic specimens, ex hb. Berol.).

In Field Mus. Bot. 8: 382 the writer referred to this species several collections from Peru, but closer study of the type material shows that this disposition was incorrect. No recent specimens have been seen that agree exactly with the type of *R. microcarpa.*

Rudgea nitida (R. & P.) Spreng. Syst. Veg. 1: 755. 1825. *Coffea nitida* R. & P. Fl. 2: 65. *pl. 217, f. a.* 1799.

A glabrous shrub or small tree; stipules semicircular, bearing dorsally a cluster of pale, subulate setae; leaves short-petiolate, subcoriaceous, oblong or elliptic-oblong, 8–12 cm. long, 2.5–5 cm. wide, obtuse or rounded and shortly produced, acute or obtuse at the base, shining above, paler beneath; inflorescence small, dense, paniculate, pedunculate, few- or many-flowered, the flowers chiefly sessile; calyx minute, 5-dentate; corolla white, 6–9 mm. long, pilose in the throat; fruit globose, red, 6–7 mm. broad. Neg. 681.

Huánuco: Described from Muña and Chicoplaya, *Ruiz & Pavón* (photo. and fragm. of authentic specimen seen, ex hb. Berol.). Chanchamayo Valley, 1,200 meters, *Schunke 291.* Above San Ramón, 1,300–1,700 meters, *Schunke A25.*

Rudgea obesiflora Standl. Field Mus. Bot. 11: 265. 1936.

A small tree 5 meters high, the trunk 6.5 cm. in diameter, glabrous throughout; stipules pale, 12–15 mm. long, broadly oblong or oblong-cuneate, shortly many-laciniate at the apex; leaves short-petiolate, elliptic-oblong or lance-oblong, 9–12 cm. long, 3–5 cm. wide, narrowly long-acuminate, acute or acuminate at the base, with about

8 pairs of lateral nerves; inflorescence terminal, long-pedunculate, trichotomous, the branches 1 cm. long, 3-flowered at the apex, the flowers sessile; calyx subrotate, 4 mm. long, 7–8 mm. wide, truncate; corolla white, in bud obtuse and 5-corniculate at the apex, the tube 10–12 mm. long and 8 mm. thick at the apex, the lobes broadly triangular, obtuse, 5–6 mm. long.

Loreto: Upper Marañón, mouth of Río Santiago, upland forest, 160 meters, *Tessmann 4070*, type.

Easy of recognition because of the curious broad corollas.

Rudgea Poeppigii Schum. in herb., sp. nov.

Frutex vel arbuscula glabra usque ad 4.5 m. alta, ramulis gracilibis vel crassiusculis; stipulae parvae latae persistentes aculeolato-ciliatae; folia sessilia vel brevissime petiolata membranacea vel papyracea oblongo-elliptica vel oblonga 8–14 cm. longa 2–6.5 cm. lata acuminata, basi acuta et saepe obliqua vel sensim versus basin anguste obtusam vel rotundatam angustata; inflorescentia vulgo parva et pauciflora corymbiformis, floribus plerumque ternatis sessilibus vel pedicellatis; calyx parvus truncatus et denticulatus; corolla alba in alabastro linearis obtusa 9–11 mm. longa, lobis brevibus; fructus albus ovoideus vel ellipsoideus 8–10 mm. longus. Neg. 686.

Loreto: Yurimaguas, *Poeppig 2467* (herb. Field Mus. No. 767,812, type); *Williams 4534; Killip & Smith 27989*. Recreo, in forest, *Williams 4162*. Between Yurimaguas and Balsapuerto, 140 meters, *Killip & Smith 28078*. Puerto Arturo, 135 meters, *Killip & Smith 27742*. Soledad, *Killip & Smith 29695*. Puerto Meléndez, *Tessmann 4578*. Soledad, *Tessmann 5311*.—San Martín: Tarapoto, *Spruce 3997*.—Without locality: *Poeppig 2153*.

Rudgea psychotriaefolia Standl. Field Mus. Bot. 8: 228. 1930.

A glabrous shrub 3 meters high with stout branches; stipules persistent, rigid, broadly ovate, 8–11 mm. long, deeply pectinate-laciniate; leaves short-petiolate, firm-membranaceous, the blades obovate or oblong-obovate, 9–20 cm. long, 4–8 cm. wide, abruptly acuminate, cuneately narrowed to the base, sometimes pulverulent beneath on the veins; inflorescence short-pedunculate, cymose-paniculate, 2–3 cm. long and broad, the flowers sessile or subsessile, congested; calyx remotely denticulate; corolla ochroleucous, sparsely and minutely puberulent, the tube 8 mm. long, the lobes half as long.

Loreto: Yurimaguas, 135 meters, in dense forest, *Killip & Smith 29016*, type. Between Yurimaguas and Balsapuerto, 140 meters, dense forest, *Killip & Smith 28270*.

Rudgea racemosa (R. & P.) Spreng. Syst. Veg. 1: 755. 1825. *Coffea racemosa* R. & P. Fl. 2: 64. *pl. 214, f. a.* 1799.

A glabrous shrub or tree 5 meters high; stipules bifid, caducous, their axils furnished with thick, gland-like setae; leaves petiolate, the blades broadly elliptic, as much as 16 cm. long and 9 cm. wide, abruptly acute or short-acuminate, acute or obtuse at the base; panicles pedunculate, many-flowered, racemosely branched, the flowers subsessile; calyx 5-dentate; corolla white; stamens exserted; fruit oval, red, about 1 cm. long. Neg. 839.

Huánuco: Described from Pati and Macora, *Ruiz & Pavón* (photo. seen, ex hb. Berol.).

The specimen of which I have seen a photograph is in fruit only, and it is not possible to determine satisfactorily the generic position of the plant. It is doubtful whether it really is a species of *Rudgea*. In the Berlin herbarium it appears to have been referred to *Faramea*, but the form of the fruit excludes it from that genus.

Rudgea retifolia Standl. Field Mus. Bot. 8: 227. 1930. *R. cephalantha* Standl. op. cit. 230.

A glabrous shrub or small tree 1–4.5 meters high with stiff branches; stipules persistent, quadrate or rounded, 2–4 mm. long, aculeolate-ciliolate; leaves sessile or nearly so, the blades more or less coriaceous, oblong-lanceolate to ovate-oblong, 6–19 cm. long, 2–6.5 cm. wide, long-acuminate, acute to acuminate at the base; flowers in small, dense, stiff-pedunculate heads about 1 cm. in diameter, the peduncles 1–3 cm. long; calyx subtruncate or remotely dentate; corolla white, glabrous or puberulent at the apex, the tube 3 mm. long, barbate in the throat; fruit globose or didymous-globose, about 5 mm. long and 6 mm. broad, white.

Loreto: Timbuchi, Río Nanay, in forest, *Williams 994*, type. Caballo-cocha, in forest, *Williams 2228*, type of *R. cephalantha*. Río Nanay, in forest, *Williams 756, 766, 729*. Yurimaguas, 135 meters, dense forest, *Killip & Smith 28023*. Peña Blanca, 110 meters, *Killip & Smith 29646*. Iquitos, *Killip & Smith 27195*. Also in Colombia.

"Amanga," "sanango de bajo," "pichico runto." The type of *R. retifolia* is a fruiting specimen and that of *R. cephalantha* one in

flower. Although when the two species were published, I thought them distinct, I can see now no means of separating them.

Rudgea sessiliflora Standl. Field Mus. Bot. 8: 228. 1930.

A glabrous shrub 2 meters high or less with slender branches; stipules deciduous, 1–2.5 mm. long, bearing at the apex a few pale, subulate setae; leaves short-petiolate, membranaceous, the blades oblong-lanceolate or narrowly elliptic-lanceolate, 4.5–8.5 cm. long, 1.5–3 cm. wide, narrowly long-acuminate, narrowed to the base; flower heads terminal, sessile, dense, few-flowered; calyx cupular, obscurely denticulate; fruit white, subglobose, 1 cm. long.

Loreto: Soledad, Río Itaya, dense forest, *Killip & Smith 29698* (type), *29575; Tessmann 5303*. Fundo Indiana, 110 meters, *Mexia 6391*. San Antonio, Río Itaya, dense forest, *Killip & Smith 29524*. —Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26666*.

Rudgea sororia Standl. Field Mus. Bot. 11: 267. 1936.

A glabrous shrub 2 meters high with rather stout branches; stipules persistent, 1–1.5 cm. long, striate, laciniate; leaves almost sessile, oblong or elliptic-oblong, 12–15 cm. long, long-acuminate, acute or obtuse at the base; inflorescence corymbose, short-pedunculate, few-flowered, short-pedicellate; calyx green or purplish, corolloid, 1.5–2 cm. long, deeply lobate, persistent; corolla white; fruit globose, finely tuberculate.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1310*, type.

Rudgea Sprucei Standl. Field Mus. Bot. 4: 333. 1929.

A glabrous shrub or tree 3–9 meters high with stout branches; stipules 5–6 mm. long, broadly ovate, obtuse, aculeolate-ciliate; leaves large, short-petiolate, subcoriaceous, the blades broadly oblong to obovate or broadly elliptic, short-acuminate or rounded at the apex and cuspidate, acute at the base; inflorescence short- or long-pedunculate, cymose-capitate or umbelliform, small, dense, few- or many-flowered, in fruit becoming more open, the flowers sessile and congested; calyx minute, 5-dentate; corolla white, coriaceous, 17 mm. long, the lobes and tube subequal; anthers exserted; fruit ovoid-globose, red, at maturity as much as 3.5 cm. long.

Loreto: Fortaleza, Yurimaguas, edge of forest, *Williams 4394*. Pumayacu, 600–1,200 meters, in forest, *Klug 3220*. Yurimaguas, in forest, *Williams 4096; Killip & Smith 27564, 29084, 29089;*

Spruce 3893.—San Martín: Forests of Mount Huairapurina, *Spruce 3995*, type. Tarapoto, *Spruce 4056*.

Rudgea stenophylla (Krause) Standl. Field Mus. Bot. 11: 268. 1936. *Palicourea stenophylla* Krause, Bot. Jahrb. 40: 338. 1908.

A shrub or small tree 5 meters high, the branches sparsely puberulent or glabrate; stipules triangular, acute, 4–5 mm. long, laciniate; leaves short-petiolate, firm, the blades narrowly oblong or oblong-lanceolate, 10–14 cm. long, 3–4 cm. wide, acuminate, sparsely pubescent beneath on the veins; inflorescence paniculate, as much as 8 cm. long, open and rather few-flowered, the flowers sessile; calyx obsoletely 5-dentate; corolla yellowish, pilose, 10 mm. long. Neg. 637.

San Martín: Dry forest near Moyobamba, 1,500 meters, *Weberbauer 4548*, type; photo. and fragm. seen, ex hb. Berol.

Rudgea tambillensis Zahlbr. Ann. Naturh. Hofmus. Wien 7: 2. 1892.

Glabrous, with slender branches; stipules semicircular, dorsally aculeolate-ciliate; leaves petiolate, ovate-oblong or oblong-lanceolate, 6–18 cm. long, 3–7.5 cm. wide, acuminate, acute or obtuse at the base, thin; panicles corymbiform, pedunculate, open, many-flowered, the flowers sessile or nearly so; calyx acutely dentate; corolla glabrous, the tube 5–7 mm. long, the lanceolate lobes of equal length; stamens scarcely exserted; fruit oval, 1 cm. long. Neg. 692.

Cajamarca: Tambillo, *Jelski 74*, type (photo. seen, ex hb. Berol.); *Raimondi 4146*.

Rudgea verticillata (R. & P.) Spreng. Syst. Veg. 1: 755. 1825. *Coffea verticillata* R. & P. Fl. 2: 66. *pl. 217, f. b.* 1799.

A glabrous shrub 3.5 meters high; stipules ovate, ciliate, deciduous; leaves on rather slender petioles, the blades subcoriaceous, oblong or obovate-oblong, up to 15 cm. long, rounded at the apex and with a short, triangular acumination, narrowed to the base; panicles pedunculate, many-flowered, lax, the flowers sessile; calyx 5-dentate; corolla white, 11–12 mm. long, the throat villous; stamens exserted. Neg. 696.

Huánuco: Type collected at Playa between Muña and Posuso, *Ruiz & Pavón*. Playa Grande and Chicoplaya, *Ruiz* (photo. of specimen in hb. Berol.). Without locality, *Ruiz & Pavón* (hb. Kew.).

Rudgea Woronowii Standl. Field Mus. Bot. 7: 155. 1930.

A glabrous shrub with stout branches; stipules persistent, 3–4 cm. long, deeply multilaciniate; leaves short-petiolate, the blades oblong-obovate, 20–30 cm. long and 10–12 cm. wide, abruptly short-acuminate or apiculate, narrowed to the acute base, with 20 or more pairs of nerves; inflorescence thyrsoid-paniculate, long-pedunculate, 7–14 cm. long, many-flowered, the pedicels 1–2 mm. long; fruit subglobose, 3–3.5 mm. long.

Loreto: Alto Río Nanay, in forest, *Williams 1081, 1077.* Also in Colombia and Venezuela.

72. PSYCHOTRIA L.

Shrubs or small trees, rarely small and only suffrutescent plants; stipules persistent, and then commonly bilobate, or caducous, and then usually entire; leaves opposite; inflorescence chiefly terminal, but in a few species axillary, variable in form, but rather rarely head-like and then seldom conspicuously involucrate, never with a showy involucre of partially united bracts, the flowers generally small, inconspicuous, and white or yellowish; calyx lobes short or elongate, often obsolete, more or less united; corolla short or elongate, with straight tube, often barbate in the throat, the lobes valvate; stamens inserted in the corolla tube, included or exserted; ovary mostly 2-celled but rarely 5-celled (subgenus *Nonatelia*); fruit baccate, containing 2 or 5 nutlets.

The genus is the largest and most complicated group of American Rubiaceae, but the species, although so numerous and often much alike in general appearance, are separated by constant and practical characters, except in a few groups in which probably too many species have been described. The species certainly are much easier of recognition than those of the genus *Palicourea.* The key given below, except for the two primary divisions, is not at all a natural one, but in view of the fact that so many of the species are known only in flower or else only in fruit, it has seemed preferable to attempt to key the species by recognizable even if not systematically important characters.

Psychotria is only vaguely separable from *Palicourea* and *Cephaelis* (and not too distinct from *Rudgea*). It is doubtless more logical to refer *Cephaelis, Palicourea,* and *Psychotria* all to *Psychotria,* as was done by Mueller in the *Flora Brasiliensis,* but all three groups are large ones, and it is decidedly convenient to maintain all of them. Although a small proportion of the plants concerned are of

uncertain generic position, ninety per cent of them can be referred at a glance definitely to a genus, at least by one who has some general knowledge of the group.

Mueller, however, maintained as distinct the genus *Mapouria*, here merged in *Psychotria*. The two genera are separable only on fruit characters, and the fruit of many species still is unknown. Even if it were known for all, I do not believe that *Mapouria* is an important group or worthy of generic rank. Although one group —the species with deciduous stipules—can be recognized by gross aspect, many others—those with persistent stipules—evidently are closely related to typical Psychotrias.

The section or subgenus *Nonatelia*, containing species with 5-celled fruit, does seem to be worthy of generic rank, but it contains only half a dozen species, and would therefore have no practical value in facilitating determination, especially since it is not easy in flowering specimens to determine the number of cells. A larger number of Palicoureas also have 5-celled fruit, and would be equally worthy of generic rank, but they are quite different in general appearance from the Psychotrias having similar fruit.

Bremekamp, in his excellent account of the Rubiaceae in Pulle's *Flora of Surinam* (1934) has proposed still further segregates from *Psychotria*, recognizing, besides *Cephaelis* and *Mapouria*, *Notopleura*, *Ronabea*, *Gamotopea*, *Petagomoa*, and *Nonatelia*, all of which are represented in Peru. While such a division of the genus may be found altogether satisfactory within a limited area, it can scarcely accommodate all the South American species of *Psychotria*, at least with the material now available for their study. Such a division, if applied uniformly to the whole genus, would involve the segregation of still further genera, a treatment that ultimately may be found most consistent.

Stipules caducous, entire or nearly so, brown or ferruginous. Plants usually blackening when dried. Subgenus *Mapouria* in part.

Young branches conspicuously pilose, villous, or hirsute.

Leaves sessile, cordate at the base.....*P. Marcgraviella.*

Leaves petiolate, acute at the base.

Flowers slender-pedicellate; leaves almost glabrous.
P. tenuicaulis.

Flowers sessile or nearly so; leaves densely hirsute or pilose.

Flowers in small, long-stalked heads; leaves hirsute on the upper surface.....*P. villosa.*

Flowers not in long-stalked heads, usually ternately clustered, the clusters sessile or short-stalked; leaves glabrous on the upper surface.....*P. zepelaciana.*

Young branches glabrous or merely puberulent.

Flowers glomerate, the glomerules spicate, the spikes paniculate. Leaves narrow, long-attenuate to the base...*P. viridis.*

Flowers glomerulate or scattered, the glomerules not spicate.

Flowers all or chiefly on short or elongate pedicels.

Panicles large, mostly 10–15 cm. long and fully as broad, lax, open, the lower branches elongate, divaricate or reflexed.

Stipules 2–2.5 cm. long.....*P. educta.*

Stipules much shorter.

Branches of the inflorescence densely pubescent. *P. acreana.*

Branches of the inflorescence glabrous or nearly so.

Leaf blades broadly ovate or elliptic, 7–16 cm. wide, abruptly contracted at the base. *P. Weberbaueri.*

Leaf blades narrowly lance-oblong or oblanceolate-oblong, mostly 5 cm. wide or less, long-attenuate to the base.

Stipules calyptriform, 2–3 cm. long..*P. abdita.*

Stipules oblong, acute, 6 mm. long. *P. pichisensis.*

Panicles small, usually much less than 10 cm. long, open or dense, the lower branches not markedly elongate, often shorter than the upper ones, mostly ascending.

Calyx large, about 2.5 mm. wide; branches of the inflorescence pruinose-puberulent. Leaf blades obovate. *P. cupularis.*

Calyx small, not more than 1.5 mm. wide; branches of the inflorescence usually quite glabrous.

Corolla 4 mm. long; pedicels usually short, or elongating only in fruit.....*P. alba.*

Corolla 2–3 mm. long; pedicels usually elongate in flower.

Panicles trichotomous, with elongate, capillary branches; leaves with a very long, almost linear acumination.....*P. juninensis.*

Panicles usually verticillately branched, with relatively stout branches; leaves acute or short-acuminate..... *P. marginata.*

Flower all sessile or practically so.

Panicles pyramidal, the lower branches elongate, spike-like, reflexed..... *P. alboviridula.*

Panicles not pyramidal, the lower branches not greatly elongate, not normally reflexed.

Leaves short-pilose or puberulent beneath, at least along the costa. Leaves small and oblong or oblanceolate-oblong; stipules obtuse..... *P. carthaginensis.*

Leaves glabrous beneath or merely pulverulent.

Inflorescence corymbose, more or less flat-topped. Leaves oblong or oblong-oblanceolate. *P. anceps.*

Inflorescence paniculate, not flat-topped.

Leaves conspicuously excavate beneath in the axils of the nerves, with large and conspicuous shelters for parasites..... *P. hospitalis.*

Leaves not excavate beneath.

Stipules acute..... *P. striolata.*

Stipules rounded at the apex.

Leaf blades elliptic or broadly elliptic. *P. Ernesti.*

Leaf blades obovate or oblong-obovate. *P. Mathewsii.*

Stipules persistent, usually green or greenish, various in form, often deeply bilobate or connate into a truncate sheath which is produced into short or elongate lobes.

Inflorescences all axillary. Plants low, often chiefly herbaceous or merely suffrutescent.

Leaves rounded or very obtuse at the apex, bullate. Flowers in small, slender-pedunculate heads..... *P. bullatifolia.*

Leaves acuminate, not bullate.

Inflorescence sessile, head-like..... *P. emetica.*

Inflorescence pedunculate, cymose or paniculate. *P. macrophylla.*

Inflorescences all or chiefly terminal.

A. Inflorescence usually open and lax, never with large or colored or green, conspicuous bracts, never consisting of few or numerous large or small heads subtended by elongate or broad bracts.

Branches densely pilose with short or long hairs; leaves densely pubescent beneath, usually pilose or hirsute.

Stipules 5–6 mm. long, acute; inflorescence umbelliform. *P. candelabrum.*

Stipules more than 1 cm. long, subulate or acuminate; inflorescence not umbelliform.

Leaves conspicuously bullate, with impressed veins. *P. Aschersoniana.*

Leaves not bullate.

Branches hirsute with long, straight, spreading hairs; flower clusters rather conspicuously bracted. *P. pilosa.*

Branches tomentose or short-pilose; flower clusters with inconspicuous bracts.

Branches finely and densely tomentose; leaves obtuse at the base; inflorescence pyramidal-paniculate..... *P. reticulata.*

Branches short-villous or short-pilose; leaves acute at the base; inflorescence usually trichotomous. *P. subtomentosa.*

Branches glabrous or puberulent or inconspicuously and very sparsely pubescent; leaves commonly glabrous or nearly so, at most inconspicuously pubescent.

Flowers in simple, usually sessile but sometimes pedunculate heads..... *P. nudiceps.*

Flowers not in simple heads.

Stipules annular and truncate or with short, obtuse lobes.

Plants epiphytic; leaves thick-coriaceous, somewhat fleshy when fresh, small; stipules annular and usually truncate. Plants wholly glabrous.

Leaf blades mostly 3–3.5 cm. wide, often rounded or subtruncate at the base, with 6–8 pairs of conspicuous lateral nerves..... *P. epiphytica.*

Leaf blades 1–2.5 cm. wide, acute or obtuse at the base, with about 4 pairs of obscure nerves. *P. semimetralis.*

Plants terrestrial; leaves not fleshy; stipules bilobate.

Lower branches of the panicle without bracts at their base.

Inflorescence ovoid-paniculate, open, the basal branches spreading..... *P compta.*

Inflorescence cyme-like, dense, compact, the basal branches strongly ascending.. *P. rhodothamna.*

Lower branches of the panicle bracted at the base.

Branches of the inflorescence refracted.

Leaf blades oblong or lance-oblong, mostly 3–5 cm. wide; panicles small, and thyrsiform. *P. falcata.*

Leaf blades broadly elliptic to obovate or elliptic-ovate, mostly 7–16 cm. wide; panicles large and pyramidal.

Calyx minute, less than 1 mm. long. *P. yapasensis.*

Calyx 2.5 mm. long..... *P. latifolia.*

Branches of the inflorescence not refracted, spreading or ascending.

Leaf blades large, mostly 7–16 cm. wide; calyx 2–3 mm. long..... *P. tinctoria.*

Leaf blades small, less than 4 cm. wide; calyx 1 mm. long or less.

Young branchlets densely pubescent. *P. retifera.*

Young branchlets glabrous.

Leaves oblong or elliptic-oblong, 2–3.5 cm. wide..... *P. virgata.*

Leaves broadly elliptic, 3.5–5 cm. wide. *P. costato-venosa.*

Stipules with acute to subulate or linear lobes.

Inflorescence spike-like, elongate, the flowers or flower clusters sessile or nearly so..... *P. stenostachya.*

Inflorescence not spike-like.

Inflorescence a narrow, racemiform or thyrsiform panicle, normally twice as long as broad or longer, usually of almost equal width throughout. Branches of the panicle often refracted.

Leaf blades rounded at the base, oblong, large, about 25 cm. long. Branches of the panicle densely pubescent..... *P. limitanea.*

Leaf blades acute or acutish at the base, usually much shorter.

Inflorescence raceme-like, consisting of few simple, small heads subtended by small but evident, greenish bracts. *P. racemifera.*

Inflorescence not raceme-like or, if so, the flowers disposed in cymules.

Foliage discoloring in drying, becoming blackish or dark reddish..... *P. Tessmannii.*

Foliage normally bright green or yellowish green when dried.

Panicles copiously hirtellous or short-pilose..... *P. huantensis.*

Panicles glabrous or obscurely and minutely puberulent.

Leaves coriaceous, with conspicuous, pale, cartilaginous borders, 3–8 cm. wide, often much elongate. *P. loretensis.*

Leaves firm-membranaceous, without conspicuous borders, mostly 2.5–4 cm. wide..... *P. patens.*

Inflorescence various, but not a narrow, elongate, open panicle.

Fruit 5-celled. Panicles small and shorter than the leaves; leaves green when dried.. *P. racemosa.*

Fruit 2-celled.

Inflorescence openly paniculate, the flowers mostly in cymules, never in distinct heads.

Bracts none at the base of the lower panicle branches; leaves with very long and narrow acuminations..... *P. cuspidata.*

Bracts present at the base of all the panicle branches; leaves never with very long and narrow acuminations.

Leaves almost sessile, the petioles only 1–2 mm. long..... *P. huallagae.*

Leaves on elongate petioles.

Calyx obsolete and scarcely perceptible in fruit; panicles glabrous or practically so, small and rounded. *P. microbotrys.*

Calyx almost 1 mm. long, conspicuous upon the fruit; panicles copiously pubescent or puberulent, large, lax, often pyramidal.

Bracts of the panicle linear, green, conspicuous..... *P. luxurians.*

Bracts of the panicle minute and inconspicuous..... *P. opima.*

Inflorescence condensed or head-like or, if paniculate, the flowers collected in small, dense heads.

Inflorescence fastigiately branched, very dense and compact, many-flowered.

Leaves blackening when dried; inflorescence densely pubescent.. *P. nigricans.*

Leaves green or yellowish green when dried; inflorescence glabrous or practically so. *P. cuspidulata.*

Inflorescence not fastigiately branched, composed of few or numerous heads or of a small, head-like cyme.

Leaves densely pilose beneath along the costa..... *P. trifida.*

Leaves glabrous beneath.

Flower heads arranged in a simple umbel; leaves all or chiefly broadest above the middle..... *P. Albert-Smithii.*

Flower heads arranged in compound umbels or in small panicles. *P. pluriceps.*

A. Inflorescence composed of one or numerous dense heads subtended by conspicuous and relatively large bracts, the heads large or small; or the inflorescence sometimes rather open, but then furnished with large or at least conspicuous, red, purple, white, or pale green bracts.

Lobes of the stipules broad and usually short, rounded to acutish at the apex.

Flower heads arranged in a simple umbel.....*P. Klugii.*

Flower heads arranged in racemes.

Leaves glabrous beneath.....*P. egensis.*

Leaves pilose beneath, at least on the costa.

Flower heads 1.5–2 cm. broad.....*P. Victoriae.*

Flower heads commonly 1 cm. or less in diameter, excluding the corollas.

Stipules 1–2.5 cm. long.....*P. pongoana*

Stipules less than 1 cm. long.

Panicle several times branched, diffuse, the branches densely pilose; bracts of the flower heads only 2–3 mm. long, spreading. *P. nautensis.*

Panicle only once or twice branched, usually narrow, the branches only sparsely pilose or glabrate; bracts of the flower heads mostly 4–6 mm. long, erect.....*P. brachiata.*

Lobes of the stipules narrow and acute or acuminate, usually linear or subulate.

Primary (lowest) branches of the inflorescence without bracts at their base, the bracts, if any, inserted some distance above the base of the branch.

Leaves, at least the uppermost, sessile or essentially so, obtuse or rounded at the base.....*P. Williamsii.*

Leaves conspicuously petiolate or, if subsessile, acute or acuminate at the base.

Inflorescence normally longer than broad, at least with an evident elongate rachis, the flower clusters pinnately disposed.

Leaf blades abruptly contracted and decurrent at the base.....*P. involucrata.*

Leaf blades merely acute or obtuse at the base. *P. moyobambana.*

Inflorescence commonly broader than long, with no elongate rachis, the flower clusters flabellately or umbellately disposed.

Corolla densely pilose with rather long, spreading hairs. Leaves sessile or practically so. *P. tarapotensis.*

Corolla glabrous, or pilose only at the apex of the lobes.

Inflorescence when dried green, without any tinge of red, about 1 cm. wide; leaves pale beneath, and with whitish veins..... *P. Herzogii.*

Inflorescence when dried more or less reddish, at least about the base of the bracts, often deep red or purple, commonly 1.5–5 cm. wide; leaves more or less tinged with red beneath, at least on the veins.

Larger bracts of the inflorescence commonly 2–2.5 cm. long, usually deep red or purple. *P. rhodophylla.*

Larger bracts mostly less than 1.5 cm. long.

Bracts obovate, rounded or very obtuse at the apex; peduncles commonly shorter than the inflorescence..... *P. Buchtienii.*

Bracts lanceolate to ovate, acute or acuminate; peduncles nearly always longer than the inflorescence..... *P. lupulina.*

Primary branches of the inflorescence with bracts inserted at their base.

Branches pilose or hirsute with long, spreading hairs. *P. pilosa.*

Branches glabrous or nearly so.

Bracts rounded-ovate or rounded-obovate, rounded at the apex. Inflorescence a small, dense, unbranched head..... *P. Ruizii.*

Bracts linear to lance-ovate, acute or acuminate.

Inflorescence evidently branched or lobate, the branches suberect or strongly ascending.

Bracts green when dried, mostly linear, small. *P. capitata.*

Bracts red or purplish, lanceolate or ovate-lanceolate, large..... *P. calochlamys.*

Inflorescence capitate or, if branched, with widely divaricate or reflexed branches.

Leaves finely pubescent beneath... *P. japurensis.*

Leaves glabrous or nearly so.

Lowest bracts short and inconspicuous, shorter than the flowers or lower branches. Inflorescence pinnately branched, with an evident elongate main axis.... *P. iquitosensis.*

Lowest bracts linear, much elongate, exceeding the flowers and the lowest branches (if any) of the inflorescence.

Heads small and few-flowered, the bracts 1 cm. long or less; leaves small, 2–3.5 cm. wide. *P. Hoffmanseggiana.*

Heads larger, many-flowered, the outer bracts mostly 2 cm. long or more; leaves mostly 3.5–6 cm. wide or larger. *P. santaremica.*

Psychotria abdita Standl. Field Mus. Bot. 4: 340. 1929.

A tree 6 meters high with glabrous branchlets; stipules connate, ferruginous, glabrous, forming a cap over the buds; leaves petiolate, thick-membranaceous, elliptic-oblong to oblanceolate-oblong, 13–24 cm. long, 2.5–9 cm. wide, long-acuminate, attenuate to the base, glabrous, with 12–16 pairs of nerves; inflorescence sessile, paniculate, 5 cm. long and 6–8 cm. wide, the branches divaricate or ascending, very minutely puberulent; pedicels 2 mm. long or less; calyx truncate; corolla white, glabrous, in bud 1.5 mm. long.

San Martín: Forests at the foot of Cerro Campana near Tarapoto, *Spruce 4351*, type.—Loreto: Pumayacu, 600–1,200 meters, in forest, *Klug 3226;* a shrub of 2.5 meters with white and yellow flowers.

The inflorescence when young is enveloped in a large, brown, cap-like bract having a long, slender beak.

Psychotria acreana Krause, Notizbl. Bot. Gart. Berlin 6: 207. 1914.

A shrub or tree 3–12 meters high, the branchlets tomentulose or glabrate; stipules 6–7 mm. long, ovate, short-acuminate, sparsely pilose outside; leaves petiolate, the blades herbaceous, obovate-oblong or obovate-spatulate, 24–27 cm. long, 12 cm. wide or less, glabrous above, short-pilose beneath especially along the costa, short-acuminate, rather abruptly narrowed and attenuate to the petiole, the lowest nerves ascending at a very acute angle; panicle pedunculate, lax, 20 cm. long and broad, the lowest branches divaricate or subrecurved; calyx dentate; corolla bright yellow, 3 mm. long, the lobes slightly shorter than the tube. Neg. 469.

Type from Monte Mo on the upper Río Acre in Brazil, *Ule 9852* (photo. and fragm. seen, ex hb. Berol.). The locality is near the Peruvian border, and the species, therefore, is to be expected confidently in Peru.

Psychotria alba R. & P. Fl. 2: 58. *pl. 205, f. a.* 1799. *Mapouria alba* Muell. Arg. Flora 59: 458. 1876. *Uragoga alba* Kuntze, Rev. Gen. 1: 299. 1891.

A shrub or small tree, 2–6 meters high, the branchlets glabrous or nearly so; stipules large, brown, obtuse, caducous; leaves short-petiolate, the blades mostly 7–16 cm. long, elliptic-oblong to obovate, acute or acuminate, acute or attenuate at the base, glabrous or sometimes sparsely puberulent beneath, usually darkening when dried; inflorescence usually pedunculate, ovoid or rounded, little if at all longer than the leaves, with opposite or verticillate basal branches, the bracts minute, deciduous; flowers short-pedicellate; calyx minutely denticulate; corolla white, 4 mm. long, minutely puberulent or glabrate; fruit subglobose, 4 mm. long, red or blackish.

Ayacucho: Carrapa, 1,000 meters, wooded hillside, *Killip & Smith 22497*.—Cajamarca: Tambillo, *Jelski 371*.—Huánuco: Described from Posuso, Muña, and Chinchao (fragm. seen, ex hb. Berol.). Cochero and Pampayacu, in forest, *Poeppig 1342*.—Junín: La Merced, 1,000 meters, *Weberbauer 1841*. Above San Ramón, 1,400–1,700 meters, forest, *Killip & Smith 24685*.—Loreto: Balsapuerto, 220 meters, *Klug 2929*. Florida, 180 meters, *Klug 2341*. Fortaleza, 140 meters, *Klug 2815, 2768*. Río Masana, *Williams 42*. Balsapuerto, dense forest, *Killip & Smith 28411*. Río Ucayali, *Tessmann 3377, 3290*. Mouth of Río Santiago, *Tessmann 4507*. —San Martín: Juan Guerra, in forest, *Williams 6848*. San Roque, in forest, *Williams 7219, 6959, 7071*. Tarapoto, *Williams 6506, 6623*.

Lamas, *Williams 6353*. Rumizapa, *Williams 6811*. Generally distributed in South America, and perhaps even more widely.

"Ucumi micuna." This species and *P. carthaginensis* are closely related and separable only by artificial characters. It seems probable that ultimately it will be necessary to combine them.

Psychotria Albert-Smithii Standl. Field Mus. Bot. 8: 203. 1930.

A shrub or tree 2.5–7.5 meters high, glabrous except for the inflorescence; stipule sheath 1–1.5 mm. long, the linear-subulate lobes 1–2 mm. long; leaves short-petiolate, the blades papyraceous, elliptic-oblong or obovate-oblong, 10–19 cm. long. 4–7 cm. wide, abruptly acuminate, acute and more or less unequal at the base, bright green when dried, with about 9 pairs of nerves; inflorescence composed of a few umbellate heads, the branches glabrous or sparsely and minutely puberulent, the flowers sessile; calyx acutely 5-dentate; corolla 2 mm. long, glabrous, white or greenish tinged with pink, barbate in the throat, the lobes more than twice as long as the tube; fruit 8 mm. long, deep red.

Loreto: Soledad on the Río Itaya, 110 meters, dense forest, *Killip & Smith 29766* (type), *29782*, *29720*. San Antonio, dense forest, *Killip & Smith 29462*, *29411*. Between Yurimaguas and Balsapuerto, *Killip & Smith 28328*. Fortaleza, 140 meters, in forest, *Klug 2772*.

Psychotria alboviridula Krause, Notizbl. Bot. Gart. Berlin 6: 208. 1914.

A shrub or small tree 1.5–7.5 meters high with glabrous branchlets; stipules ovate-lanceolate, acute, 6–8 mm. long; leaves short-petiolate or almost sessile, blackish or brownish when dried, the blades elliptic-oblong to lance-oblong, commonly 15–30 cm. long, usually very long-acuminate, acute to obtuse at the base, glabrous, with 10–16 pairs of nerves; panicles chiefly large and many-flowered, open, with few spreading or refracted branches, equaling or longer than the leaves, long-pedunculate; calyx minutely acute-dentate; corolla greenish white, the tube 3–3.5 mm. long, the lobes shorter; fruit deep red or purple. Neg. 468.

Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26462*.—Loreto: La Victoria, in forest, *Williams 2534*, *2803*. Caballococha, *Williams 2316*. Masana, *Williams 8178*. Fortaleza, Yurimaguas, edge of forest, *Williams 4484*. Parana Pura, Yurimaguas, in forest, *Williams 4604*. Santa Rosa, 135 meters, *Killip & Smith*

28972. Nuevo París, *Tessmann 3382*. Puerto Arturo, *Killip & Smith 27878*. Mishuyacu, 100 meters, *Killip & Smith 29888*. Florida, 180 meters, *Klug 2303*. Iquitos, in forest, *Killip & Smith 27050, 27046*. Yurimaguas, 135 meters, *Killip & Smith 27680*. Type from Seringal San Francisco, Río Acre, presumably in Brazil, *Ule 9846* (photo. and fragm. seen, ex hb. Berol.). Amazonian Brazil.

Psychotria anceps HBK. Nov. Gen. & Sp. 3: 360. 1820. *P. lucida* HBK. op. cit. 361. *pl. 283*. 1820.

A glabrous shrub 2 meters high, or sometimes a small tree; stipules large, ovate, acutish, brown; leaves short-petiolate, coriaceous, oblong to lance-oblong or elliptic-oblong, acute or short-acuminate, attenuate at the base, lustrous, blackish when dried; inflorescence corymbiform, pedunculate, trichotomous at the base, the flowers sessile; calyx with triangular, acute or obtuse teeth; corolla white or greenish, 4 mm. long, glabrous; fruit red, globose, 3 mm. long. Neg. 443.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 971*. Colombia.

Psychotria Aschersoniana Schum. & Krause, Bot. Jahrb. 40: 330. 1908.

A shrub or small tree with densely yellowish-pilose branchlets; stipules biparted, the subulate lobes 10–15 mm. long; leaves slender-petiolate, large, the blades oblong-lanceolate, very long-acuminate, acute or attenuate at the base, conspicuously and closely bullate, densely pubescent; inflorescence much shorter than the leaves, paniculate, at first very dense but in fruit becoming more open, the flowers short-pedicellate; calyx obsoletely denticulate; corolla yellow or white, glabrous outside; fruit black, glabrous, 4 mm. long.

Cajamarca: Tambillo, *Raimondi 6785*. Ranging to the mountains of Colombia.

Psychotria brachiata Sw. Prodr. 45. 1788. *P. caerulea* R. & P. Fl. 2: 62. *pl. 213, f. b*. 1799. *Palicourea caerulea* R. & S. Syst. Veg. 5: 194. 1819. *Cephaelis polycephala* Schlecht. Linnaea 28: 532. 1856.

A shrub with glabrous branches; stipules short, green, persistent, bilobate, the broad lobes obtuse or rounded; leaves on rather slender petioles, the blades oblong-obovate to oblong-elliptic, short-acuminate, acute or attenuate at the base, glabrous or nearly so, often

pilose beneath along the costa; inflorescence long-pedunculate, thyrsoid-paniculate or racemose, the opposite branches divaricate, subtended at the base by long, narrow bracts, the flowers in small, dense, many-bracted heads; corolla blue or white; fruit blue.

Huánuco: Type of *P. caerulea* from Vitoc, *Ruiz & Pavón*. Prov. Huamalíes, *Weberbauer 3593*.—Loreto: Above Pongo de Manseriche, 200 meters, *Mexia 6328*.—Puno: Sangabán, *Lechler 2364*, type collection of *Cephaelis polycephala*.—San Martín: Tocache, *Poeppig* in 1830. Widely distributed in tropical America.

Psychotria Buchtieni (Winkl.) Standl. Field Mus. Bot. 7: 303. 1931. *Uragoga Buchtieni* Winkl. Repert. Sp. Nov. 8: 5. 1910.

A stiff shrub 1–4 meters high, glabrous or nearly so except in the inflorescence; stipules short, bilobate, the narrow lobes 1–2 mm. long; leaves short-petiolate, ovate-oblong to oblong-elliptic, long-acuminate, acute or acuminate at the base, sparsely short-pilose beneath along the nerves; inflorescence pedunculate, small and compact, rounded, densely short-pilose, radiately branched at the base, the flowers glomerate and sessile, the bracts foliaceous, as long as the flowers; calyx truncate and 5-denticulate; corolla white, pilosulous, 4–5 mm. long, densely barbate in the throat; fruit 4 mm. long. Neg. 717.

Loreto: Mishuyacu near Iquitos, 100 meters, in forest, *Klug 686*. Also in Bolivia.

Psychotria bullatifolia Standl. Field Mus. Bot. 8: 193. 1930.

Plants suffrutescent or herbaceous, simple, the stems 10–12 cm. long or more, sparsely puberulent or glabrous; leaves few, petiolate, the blades herbaceous, oblong or oval-oblong, 7–12 cm. long, 3.5–5.5 cm. wide, obtuse or rounded at the apex and short-apiculate, acute to almost rounded at the base, strongly bullate, sparsely sordid-pilosulous beneath, with about 13 pairs of nerves; inflorescences axillary, slender-pedunculate, head-like, densely many-flowered, almost 1 cm. broad; pedicels in fruit as much as 4 mm. long; fruit oval, 6 mm. long, glabrous.

Loreto: Pebas, on the Amazon, in forest, *Williams 1803* (type), *1666*, *1662*.

Psychotria calochlamys Standl. Field Mus. Bot. 8: 199. 1930.

A shrub 1–2 meters high, the branches glabrous or very minutely puberulent; stipules green or reddish, bifid almost to the base, 1.5–2.8 cm. long, the lobes long-attenuate; leaves short-petiolate, sub-

coriaceous or thinner, the blades lance-oblong to elliptic-oblong or rarely ovate, 7.5–20 cm. long, 2.5–7 cm. wide, very long-acuminate, acute at the base, glabrous or minutely puberulent beneath on the costa, with about 15 pairs of nerves; inflorescence long-pedunculate, consisting of a head-like cyme 2–6 cm. broad, or in fruit more open, the bracts pink or purple, about equaling the flowers, very showy; corolla pink, glabrous outside, 12 mm. long, the lobes 2–2.5 mm. long; fruit deep purple, oval, 6–7 mm. long.

Loreto: Santa Ana on the upper Río Nanay, *Williams 1226*, type. Río Nanay, *Williams 752, 839*. Timbuchi, in forest or inundated places, *Williams 1042, 1041*. Río Itaya near Iquitos, 110 meters, *Killip & Smith 29387*. Mouth of Río Santiago, 160 meters, *Tessmann 3952*. Soledad, 110 meters, *Tessmann 5296*. Mishuyacu, *Klug 730, 829, 688, 357*. Iquitos, *Williams 1502, 3679; Killip & Smith 27194, 27000, 27002*.

"Chirapa shacha," "shuturi." The shrub must be a handsome one when growing because of the brightly colored inflorescences. Tessmann reports that the bracts are sometimes white.

Psychotria candelabrum Standl. Field Mus. Bot. 8: 207. 1930.

A shrub with velvety-pilosulous branchlets; stipule sheath 1–1.5 mm. long, the triangular, acute lobes 4–5 mm. long; leaves short-petiolate, firm-membranaceous, the blades obovate-elliptic, 20–24 cm. long, 9–10 cm. wide, caudate-acuminate, cuneately narrowed to the base, puberulent or minutely pilosulous on the veins; inflorescence cymose-umbellate, pedunculate, small and dense, 3.5 cm. wide, the pale branches velvety-pilosulous, naked at the base, the small, dense cymes almost head-like; bracts linear or subulate, 3–6 mm. long; calyx acutely dentate, pilosulous.

Loreto: La Victoria on the Amazon, in forest, *Williams 2702*, type.

Psychotria capitata R. & P. Fl. 2: 59. *pl. 206, f. a.* 1799. *Cephaelis peruviana* Spreng. Syst. Veg. 1: 749. 1825. *P. inundata* Benth. in Hook. Journ. Bot. 3: 229. 1841. *P. arcuata* Benth. loc. cit.

A shrub 1–3 meters high, glabrous except in the inflorescence; stipules green, biparted, with long, subulate lobes, those near the ends of the branches lanceolate and longer; leaves short-petiolate, lanceolate to oblong-elliptic or oval, acuminate, acute or obtuse at the base, dull green when dried, with numerous pale nerves; inflorescence pedunculate, paniculate, rather dense, shorter than the leaves, small, the branches pubescent, opposite or verticillate;

bracts lanceolate or linear, green or whitish, about equaling the flowers; calyx teeth unequal; corolla white or ochroleucous, glabrous, 8–9 mm. long, the lobes almost equaling the tube; fruit subglobose, 4 mm. long, coarsely costate, black. Neg. 510.

Huánuco: Type from Chinchao, *Ruiz & Pavón.* Cochero, *Poeppig 2035.*—Junín: La Merced, 1,200 meters, sunny thickets, *5730.* Above San Ramón, 1,400–1,700 meters, *Killip & Smith 24707.* Chanchamayo Valley, 1,200–1,800 meters, *Schunke 427, 263, 1378, 327.*—Loreto: La Victoria, in forest, *Williams 2960.* San Antonio, 110 meters, *Killip & Smith 29355.* Mouth of Río Tigre, wooded bank, *Killip & Smith 27520.* Paraíso, *Williams 3304.* Mishuyacu, *Klug 973.* Mainas, *Poeppig.* Alto Río Itaya, *Williams 3429.*—San Martín: Tarapoto, *Williams 6593, 5875, 6091, 6068, 6113; Ule 6555.* Lamas, *Williams 6345.* Ranging from Bolivia and Brazil to the Guianas, Trinidad, and Central America.

"Cucha caspi," "trompetero caspi." If I have interpreted *P. capitata* correctly, as I think is the case, *P. inundata* is a clear synonym. It appears likewise that *P. chlorotica* Muell. Arg., a name under which some of the Peruvian material has been distributed, should be reduced to synonymy under *P. capitata.* The characters used by Mueller in separating *P. chlorotica* and *P. inundata* are certainly of little or no importance.

Psychotria carthaginensis Jacq. Enum. Pl. Carib. 16. 1760. *P. foveolata* R. & P. Fl. 2: 59. *pl. 207, f. b.* 1799. *Uragoga foveolata* Gómez, Anal. Hist. Nat. Madrid 23: 294. 1894.

A nearly glabrous shrub 1–3 meters, high; stipules large, thin, obovate, obtuse, brownish; leaves short-petiolate, the blades lance-elliptic to oblong-obovate, broadest at or above the middle, acute or acuminate, acute to attenuate at the base, puberulent beneath along the nerves or glabrate; inflorescence pedunculate, paniculate, open, usually radiately branched at the base, many-flowered, the minute bracts deciduous; calyx obsoletely denticulate; corolla white, glabrous or minutely puberulent, 4 mm. long; fruit red, 4 mm. long. Neg. 483.

Amazonas: Chachapoyas, *Mathews.*—Huánuco: Type material from Chinchao and Cocherò, *Ruiz & Pavón* (photo. and fragm. of authentic specimen seen, ex hb. Berol.). Posuso, 600 meters, *4677.* Cuschi, 1,500 meters open forest, *4854.* Yanano, 1,800 meters, sunny slope, *3718.* Río Huallaga Canyon below Río Santo Domingo, 1,200 meters, in forest, *4196.*—Junín: Chanchamayo, *Raimondi 2757.*

—Loreto: Ucayali Valley, *Tessmann 3382, 3302.*—Puno: Near Sandía, 1,500–2,000 meters, *Weberbauer 1073.*—San Martín: Tarapoto, *Williams 5809; Spruce 4288.* Río Mayo, *Spruce 4350.* Widely distributed in South and Central America.

The determinations of some of the specimens cited are more or less uncertain. In this species the leaves often are domatiate beneath, that is, provided along the costa with small, sack-like structures that house parasites.

Psychotria compta Standl. Field Mus. Bot. 8: 202. 1930.

Plants shrubby or only suffrutescent, 0.5–3.5 meters high, simple or branched, glabrous outside the inflorescence; stipules 7 mm. long, connate into a sheath 2 mm. long, the lobes broadly ovate-triangular, obtuse; leaves large, short-petiolate, the blades firm-membranaceous, broadly elliptic or ovate-elliptic or rarely oblong-ovate, 13–26 cm. long, 6–15 cm. wide, cuspidate-acuminate, acute or obtuse at the base and often abruptly decurrent, bright green when dried, paler beneath, with about 12 pairs of nerves; inflorescence peduncular, cymose-paniculate, broadly ovoid, about 5–6 cm. long and broad, the branches not bracteate at the base, often reflexed in fruit, the flowers sessile or nearly so; corolla ochroleucous, minutely puberulent, the tube 5–8 mm. long, the lobes 2.5–3 mm. long; fruit pale blue or white, didymous-globose, 6–9 mm. wide.

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 22903.*—Junín: Eneñas, 1,700 meters, dense forest, *Killip & Smith 25633.* Above San Ramón, 1,500 meters, *Killip & Smith 24584, 24601.*—Loreto: Yurimaguas, 135 meters, in forest, *Killip & Smith 29098* (type), *27590, 27968, 29038; Williams 3881.*

Psychotria costato-venosa Schlecht. Linnaea 28: 497. 1856.

Branches glabrous; stipules connate into a sheath 4 mm. long, obtusely bilobate at the apex; leaves short-petiolate, the blades broadly elliptic, 7.5–10 cm. long, 3.5–5 cm. wide, acute at base and apex, pilose on both sides along the costa, coriaceous, with 12–14 pairs of lateral nerves; inflorescence paniculate, terminal, few-flowered, glabrous, the bracts elongate-triangular; calyx lobes ovate, acutish; corolla puberulent at the apex, the lobes longer than the tube; fruit nearly 12 mm. long and 8 mm. wide, 8-costate. Neg. 25777.

Puno: Type from Tabina, *Lechler 2077.* Known to the writer only from the original description and a leaf; probably a species of *Palicourea.* The inflorescence is not shown in the photograph cited.

Psychotria cupularis (Muell. Arg.) Standl. Field Mus. Bot. 8: 210. 1930. *Mapouria cupularis* Muell. Arg. Flora 59: 459, 465. 1876.

A shrub or small tree, glabrous or nearly so; stipules brownish, obtuse; leaves on short or somewhat elongate petioles, the blades subcoriaceous, dark when dried, oblong-obovate or elliptic-obovate, 3–7 cm. wide, rounded or obtuse at the apex and shortly cuspidate-acuminate, acute to long-attenuate at the base; inflorescence small, umbel-like or paniculate, the bracts small and inconspicuous, the flowers sessile or almost so; calyx obscurely denticulate; corolla white, 6–7 mm. long, barbate in the throat, the lobes almost equaling the tube. Neg. 6066.

Loreto: Pebas on the Amazon, in forest, *Williams 1749*. Also in Amazonian Brazil.

Psychotria cuspidata Bredem. ex R. & S. Syst. Veg. 5: 192. 1819.

A slender, glabrous shrub or small tree, 1–5.5 meters high; stipules green, persistent, short, bicuspidate: leaves thin, short-petiolate, bright yellowish green when dried, the blades ovate to elliptic or oblong-elliptic, very narrowly long-acuminate, usually with a curved acumination, acute to obtuse at the base; inflorescence pedunculate, thyrsoid-paniculate, much shorter than the leaves, rather few-flowered, the few pale branches sometimes reflexed, not bracted at base; calyx minute, truncate; corolla glabrous, 5 mm. long, pale yellow or white; stamens exserted; fruit didymous-globose, smooth. Neg. 534.

Cajamarca: Tambillo, *Raimondi 6201, 7427*.—Huánuco: Cochero, *Poeppig 1598*.—Junín: Puerto Yessup, 400 meters, dense forest, *Killip & Smith 26267*.—Loreto: Manfinfa, Alto Río Nanay, *Williams 1128*. Sierra del Pongo, 500 meters, *Mexia 6268*. Timbuchi, in forest, *Williams 948*. Iquitos, 100 meters, *Killip & Smith 27023, 27003; Tessmann 3696*. Caballo-cocha, in forest, *Williams 2262*. Peña Blanca, 110 meters, *Killip & Smith 29656*.—San Martín: Tarapoto, *Williams 6114, 5884, 5879; Spruce 4903*. San Roque, *Williams 7510, 6947*. Widely distributed in tropical America.

"Yaku shuturi." *Tessmann 3696* is referable to the var. *compacta* Muell. Arg., in which the inflorescence is dense and compact, rather than open, as is more usual for the species.

Psychotria cuspidulata (Krause) Standl. Field Mus. Bot. 8: 201. 1930. *Cephaelis cuspidulata* Krause, Notizbl. Bot. Gart. Berlin 8: 102. 1922.

A glabrous shrub 3 meters high; stipules 4–6 mm. long, bidentate; leaves short-petiolate, thick-membranaceous, yellowish green when dried, the blades ovate-oblong or ovate-lanceolate, 15–20 cm. long, 5.5–7 cm. wide, narrowly long-acuminate, obtuse or acutish at the base; inflorescence pedunculate, small, cymose but dense and almost head-like, many-flowered; calyx lobes lanceolate, acute; corolla whitish, sparsely whitish-pilose, the tube 5–7 mm. long. Neg. 718.

Loreto: Cerro de Escalera, 1,200 meters, *Ule 6551*, type (photo. and fragm. seen, ex hb. Berol.).

Psychotria educta Standl. Field Mus. Bot. 11: 237. 1936.

A shrub 3 meters high, the branches glabrous; stipules deciduous, very broadly ovate or elliptic, 2–2.5 cm. long, acute or acuminate, sparsely ferruginous-villosulous, equaling or longer than the petioles; leaves very shortly petiolate, chartaceous, oblanceolate, oblong-oblanceolate, or rhombic-oblanceolate, 23–33 cm. long, 7–10 cm. wide, gradually acuminate, gradually long-attenuate to the base, glabrous above or nearly so, beneath at first ferruginous-villosulous or puberulent, soon glabrate, the lateral nerves about 16 pairs; inflorescence terminal, pedunculate, laxly paniculate, large, the slender branches mostly verticillate, spreading or subreflexed, sparsely puberulent or glabrate, bracteate at the base, the flowers umbellately clustered, the pedicels 1–2 mm. long; calyx 1.2 mm. long, truncate, remotely repand-denticulate; corolla ochroleucous, glabrous outside, 2.5 mm. long, the throat not barbate, the lobes glabrous within; anthers exserted.

Loreto: In upland forest at the edge of a stream, mouth of the Río Santiago, upper Río Marañón, 160 meters, *Tessmann 4057*, type.

Psychotria egensis Muell. Arg. Flora 59: 542, 545. 1876.

A shrub 1 meter high with rather stout, glabrous branchlets; stipules short, persistent, shallowly bilobate, the lobes rounded; leaves short-petiolate, yellowish green, the blades thick, oblong or oblong-elliptic, acute or short-acuminate, acute at the base; inflorescence terminal, pedunculate, the flowers in head-like, long-pedunculate clusters racemosely arranged along a stout rachis, the stout branches opposite, glabrous; bracts broad, conspicuous, as long as the flowers, ciliate, none present at the base of the branches; corolla white, glabrous outside.

Junín: La Merced, 1,200 meters, *5748*.—San Martín: Mountains along the Río Mayo near Tarapoto, *Spruce 4347*. San Roque, *Williams 7416*. Amazonian Brazil.

Psychotria emetica L. f. Suppl. Pl. 144. 1781. *Cephaelis emetica* Pers. Syn. Pl. 1: 203. 1805. *Uragoga emetica* Baill. Hist. Pl. 7: 371. 1880. *C. plagiantha* Standl. Field Mus. Bot. 11: 190. 1936.

Stems usually simple, woody or only suffrutescent, 30 cm. high or more, puberulent; stipules free, 3–4 mm. long, triangular-lanceolate, acuminate; leaves short-petiolate, dark when dried, the blades elliptic-oblong to oblanceolate-oblong, acute or acuminate, acute to long-attenuate at the base, glabrous above, puberulent beneath; inflorescences axillary, about as long as the petioles, solitary or geminate, bearing a few capitate, subsessile flowers, the bracts minute; calyx obscurely dentate; corolla white, 5 mm. long, glabrous; fruit 6 mm. long, bright blue.

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 22876*.—Loreto: Florida, *Klug 2045*, type of *C. plagiantha*. San Antonio, *Ule 6769*. Bolivia to Central America, in lowland forests.

Called "ipecacuana falsa" in Bolivia, and "raicilla" in Panama. The roots, which have a strong and somewhat nauseous odor, are one of the sources of the drug ipecac, but they are said to be much inferior to those of *Cephaelis Ipecacuanha*.

Psychotria epiphytica Krause, Bot. Jahrb. 40: 430. 1908, nomen; Verh. Bot. Ver. Brandenb. 50: 108. 1908.

A small, glabrous, epiphytic shrub; stipules united below, the free portion entire, ovate, acute, 4–5 mm. long; leaves short-petiolate, thick-coriaceous, fleshy when green, the blades oblong-ovate to oblong, 6–8 cm. long, 3–3.5 cm. wide, acute or acuminate, obtuse to subtruncate at the base; inflorescence paniculate, pedunculate, very lax and open, many-flowered, equaling or much exceeding the leaves, the pedicels 2–4 mm. long; calyx obsoletely dentate; fruit black, 3–4 mm. in diameter. Neg. 462.

Loreto: Cerro de Escalera, 1,400 meters, *Ule 6692*, type (photo. and fragm. seen, ex hb. Berol.).

Psychotria Ernesti Krause, Verh. Bot. Ver. Brandenb. 50: 109. 1908.

A nearly glabrous shrub or small tree, 1–3 meters high, with stout branchlets; stipules oblong-ovate, obtuse or acutish, 2 cm. long or less; leaves large, short-petiolate, often darkening when dried, the blades elliptic to rounded-elliptic, 9–13 cm. wide, acute, rounded to acute at the base, with 15–19 pairs of nerves; inflorescence pedunculate, large but usually shorter than the leaves, radiately branched

at the base, many-flowered and rather dense; calyx obsoletely 5-dentate; corolla white, glabrous outside, the tube 2–2.5 mm. long, densely barbate in the throat. Neg. 459.

Loreto: Florida, 180 meters, in forest, *Klug 2327*. Río Sungarosa, 200 meters, stream border, *Mexia 6305*. Fortaleza, Yurimaguas, edge of water, *Williams 4341, 4445, 4242*. Middle Río Ucayali, 150 meters, *Tessmann 3302*. Also in Brazil along the upper Amazon, and in Colombia.

Psychotria falcata Rusby, Mem. Torrey Club 3, pt. 3: 47. 1893.

An almost glabrous shrub; stipules 3–4 mm. long, united below, bilobate, the very short lobes obtuse; leaves short-petiolate, olive-green when dried, the blades oblong or elliptic-oblong, medium-sized, long-acuminate, acute at the base; inflorescence long-pedunculate, cymose-paniculate, narrow but open, many-flowered, the branches puberulent, some of them often reflexed, the bracts minute; flowers sessile or nearly so; calyx acutely dentate; corolla glabrous, 7 mm. long, the short lobes obtuse.

Junín: Chanchamayo Valley, *Schunke 409*. Above San Ramón, 1,400–1,700 meters, *Killip & Smith 24596*.—San Martín: Tarapoto, *Williams 5962*. Also in Bolivia.

Psychotria Herzogii S. Moore, Med. Rijks Herb. 46: 25. 1922.

A slender, glabrous shrub 1 meter high or less; stipules biparted, 6–8 mm. long, with subulate segments; leaves firm-membranaceous, green when dried, subsessile, ovate-oblong, 2–4 cm. wide, acuminate to obtuse, obtuse or rounded at the base; inflorescences cymose-paniculate, pedunculate, dense, few-flowered, much shorter than the leaves, the bracts equaling the flowers; calyx obscurely denticulate; corolla white, almost 1 cm. long, glabrous outside; fruit blue, didymous, glabrous, 5 mm. in diameter.

Loreto: Yurimaguas, *Poeppig 2124*. San Antonio, in forest, *Williams 3413*. Fortaleza, Yurimaguas, edge of forest, *Williams 4393, 4218*. Soledad, 110 meters, dense forest, *Killip & Smith 29699, 29569*. Mouth of Río Santiago, 160 meters, *Tessmann 4264*. Santa Rosa, 135 meters, *Killip & Smith 28712*. Also in Bolivia.

Psychotria Hoffmannseggiana R. & S. Syst. Veg. 5: 214. 1825.

A small, slender shrub with glabrous or obscurely puberulent branchlets; stipules 1 mm. long, biparted, with narrow lobes; leaves small, membranaceous, very shortly petiolate, the blades lance-oblong or elliptic-oblong, 3–8 cm. long, acute or acuminate, acute

and oblique at the base, glabrous or nearly so; flower heads short-pedunculate, few-flowered, small, subtended by 2 conspicuous, narrow, elongate bracts; calyx minutely 5-dentate; fruit 3 mm. long. Neg. 745.

Loreto: Río Nanay, in forest, *Williams 832, 853.* Amazonian Brazil and the Guianas.

Psychotria hospitalis Standl. Field Mus. Bot. 8: 199. 1930.

A nearly glabrous shrub 3 meters high; stipules 5 mm. long, triangular-ovate, acute; leaves blackish when dried, short-petiolate, the blades thick-membranaceous, oblong or obovate-oblong, 7–11 cm. long, 2–4.5 cm. wide, abruptly acuminate or long-acuminate, attenuate to the base, furnished beneath along the costa with large and conspicuous shelters for parasites; inflorescence pedunculate, cymose-paniculate, lax and open, many-flowered, 2.5–3 cm. long and broad; corolla white; calyx 5-dentate; fruit 6 mm. long, glabrous, coarsely costate.

Loreto: Río Nanay, in forest, *Williams 845*, type. Puerto Arturo, Yurimaguas, in pasture, *Williams 5189.* Pongo de Manseriche, *Mexia 6337.* Also in Colombia.

Psychotria huallagae Standl. Field Mus. Bot. 8: 376. 1931.

A glabrous shrub; stipules bifid, the segments linear-filiform; leaves subsessile, membranaceous, dull green when dried, the blades oblanceolate-oblong or narrowly elliptic-oblong, 6–11 cm. long, 2–4 cm. wide, abruptly acute or short-acuminate, slightly narrowed to the acute base, the lateral nerves about 12 pairs; inflorescence pedunculate, half as long as the leaves, cymose-paniculate, broadly pyramidal, 2 cm. long and 3.5 cm. wide, the flowers sessile or nearly so; calyx 5-dentate; fruit 5 mm. long, glabrous, obscurely costate.

Loreto: Puerto Arturo, Yurimaguas, 150–200 meters, *Williams 5265*, type. Amazonian Brazil.

Psychotria huantensis Standl. Field Mus. Bot. 8: 196. 1930.

A shrub 3–3.5 meters high, the branchlets sparsely hirtellous; stipules short-connate, the segments lance-triangular, 4–5 mm. long; leaves short-petiolate, green when dried, thin-coriaceous, the blades oblong or lance-oblong, 16 cm. long and 5.5 cm. wide, short-cuspidate, subobtuse or rounded at the base, sparsely hispidulous beneath on the veins or glabrate; inflorescence pedunculate, paniculate, narrowly pyramidal, 13 cm. long and 10 cm. wide, the branches spreading or subreflexed, densely pilosulous, much elongate, the flowers more

or less secund, sessile; calyx minute, truncate; fruit subglobose, 4 mm. long, hirtellous.

Ayacucho: Estrella, in dense woods, 500 meters, *Killip & Smith 22633*, type.

A relative of *Psychotria patens* Sw.

Psychotria involucrata Sw. Prodr. 45. 1788.

A nearly glabrous shrub or small tree, 1–6 meters high; stipules short, green, truncate and bicuspidate; leaves petiolate, firm, medium-sized, lanceolate to ovate or oblong-elliptic, long-acuminate, abruptly contracted and decurrent at the base, dull green when dried; inflorescence pedunculate, less than a third as long as the leaves, commonly 1–2 cm. long, dense and contracted, rather few-flowered, the short branches purplish, pubescent, the flowers sessile or nearly so; outer bracts narrow, much longer than the flowers; calyx denticulate; corolla creamy or greenish white; fruit globose, 4 mm. long, variously described as purple, purple-black, light blue, or white. "Yaku shuturi."

Huánuco: Reported from Chicoplaya, *Ruiz* (teste Urban).—Junín: Yapas, 1,400 meters, dense forest, *Killip & Smith 25501, 25605*.—Loreto: Río Nanay, in forest, *Williams 1056*. Timbuchi, *Williams 862, 1037, 874, 869*. Iquitos, 100 meters, *Williams 8091; Killip & Smith 27350, 29745*. Punchana, *Williams 8006*. Mainas, *Poeppig Add. 28*. La Victoria, *Williams 2705*. Fortaleza, Yurimaguas, in forest, *Williams 4252*. Santa Rosa, *Williams 4842*. Yurimaguas, *Williams 4110*.—San Martín: San Roque, *Williams 7311*. Lamas, *Williams 6394*. Widely distributed in tropical America.

Psychotria iquitosensis Standl. Field Mus. Bot. 8: 195. 1930.

A shrub 3.5 meters high or less, glabrous except in the inflorescence; stipules green, connate into a short sheath, the linear-subulate lobes 3–4 mm. long; leaves short-petiolate, thick-membranaceous, bright or yellowish green when dried, the blades lance-oblong or ovate-oblong, 7–17 cm. long, 2.5–6 cm. wide, very long-acuminate, acute at the base or abruptly contracted and decurrent; inflorescence pedunculate, cymulose-racemose, about 1.5–3.5 cm. long and broad, the branches divaricate or subreflexed, sparsely and minutely pilose or glabrate, simple or trifid at the apex, the lanceolate, persistent bracts 2–5 mm. long; calyx minutely denticulate; corolla white, glabrous, the tube 2.5–3 mm. long, barbate in the throat, the lobes 1.5 mm. long; fruit purple or deep blue, 3–3.5 mm. long.

Loreto: Near Iquitos, *Williams 1391* (type), *1524, 3633; Killip & Smith 27244, 27208, 26926, 27019.* Punchana, *Williams 1337.* Santa Rosa, 135 meters, dense forest, *Killip & Smith 28746, 28792.* Florida, 180 meters, riverside forest, *Klug 2271.* "Mitir-ey" (Huitoto name).

Psychotria japurensis Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 328. 1881.

A shrub, the branchlets minutely puberulent or tomentulose; stipules 3 mm. long, the lobes linear-subulate, rigid; leaves firm-membranaceous, short-petiolate, yellowish green when dried, the blades ovate to elliptic-oblong, 10–17 cm. long, long-acuminate, cuneate-acute at the base, finely puberulent beneath; inflorescence capitate-umbellate, short-pedunculate, the heads small and dense, short-stalked, the linear bracts conspicuous and greatly exceeding the flowers; calyx obtusely dentate; corolla rufous-hirtous, 4 mm. long; fruit globose, costate, 3–4 mm. long. Neg. 6085.

Loreto: Pebas on the Amazon, in forest, *Williams 1681.* Also in Amazonian Brazil.

Psychotria juninensis Standl. Field Mus. Bot. 8: 206. 1930.

A slender, glabrous shrub 1.5–2 meters high; stipules small, acuminate, deciduous; petioles short and slender, the blades membranaceous, pale-marginate, oblong-elliptic, 7–9.5 cm. long, 2–3.5 cm. wide, caudately long-acuminate, acute at the base, with about 7 pairs of nerves; inflorescence almost equaling the leaves, slender-pedunculate, cymose-corymbose, 5 cm. wide, the bracts minute, the pedicels 3 mm. long; calyx truncate or remotely denticulate; corolla greenish white.

Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26525,* type. Above Pongo de Manseriche, 200 meters, dense forest, *Mexia 6230.*

Psychotria Klugii Standl. Field Mus. Bot. 8: 377. 1931.

A shrub 1.5 meters high, the branches glabrous; stipules persistent, oval-ovate, 1 cm. long, acutish, glabrous; leaves short-petiolate, narrowly lance-oblong, 23–31 cm. long, 7–8.5 cm. wide, narrowly attenuate-acuminate, long-attenuate to the base, thick-membranaceous, glabrous, the lateral nerves about 12 pairs; inflorescence terminal, pedunculate, composed of umbellately disposed heads on peduncles 6–10 mm. long, the heads 1 cm. in diameter, dense, few-flowered, the outer bracts broadly ovate or oval, obtuse,

6–8 mm. long, glabrous; flowers white, sessile; calyx 0.6 mm. long, obsoletely repand-denticulate.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 835* (type), *519*.

Psychotria limitanea Standl. Field Mus. Bot. 8: 197. 1930.

A shrub, glabrous except in the inflorescence; stipule lobes linear-subulate, 2 cm. long; petioles short and stout, 7 mm. long or less; leaf blades green when dried, coriaceous, narrowly margined, narrowly oblong, 26 cm. long, 8 cm. wide, acuminate, rounded at the base; inflorescence long-pedunculate, cylindric-paniculate, 20 cm. long and 4 cm. wide, the branches more or less reflexed, hispidulous-puberulent, not bracted at the base, the flowers often secund; calyx minute, subtruncate; fruit didymous-globose, glabrous, 5 mm. broad, prominently nerved.

Loreto: La Victoria, on the Amazon, in forest, *Williams 3006*, type.

Psychotria loretensis Standl. Field Mus. Bot. 8: 198. 1930.

A slender shrub 2.5–4.5 meters high, glabrous except in the inflorescence; stipules connate into a short sheath, the lobes subulate, 3–4 mm. long; leaves coriaceous, green when dried, short-petiolate, the blades mostly oblong or lance-oblong, 10–24 cm. long, 3–8 cm. wide, long-acuminate, acute or obtuse at the base; inflorescence pedunculate, cylindric-paniculate or narrowly pyramidal-paniculate, 5–18 cm. long, 3–9 cm. wide, laxly many-flowered, the short branches spreading or reflexed, glabrous or minutely puberulent, the flowers often somewhat secund; calyx obtusely lobulate; corolla yellow, glabrous outside, 5 mm. long, the throat glabrous; fruit orange, subglobose, 4–5 mm. in diameter.

Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26561*. Santa Rosa, 700 meters, *Killip & Smith 26179, 26167*.—Loreto: Iquitos, 100 meters, in woods, *Killip & Smith 27482* (type), *26988; Williams 3788, 8108*. Punchana, in forest, *Williams 3771*. Mishuyacu, 100 meters, *Klug 631, 535, 839; Killip & Smith 29862*. Río Nanay, *Williams 856, 720*. Timbuchi, edge of jungle, *Williams 1016*. Balsapuerto, 150–350 meters, *Killip & Smith 28398, 28606, 28405, 28388, 28542*. Florida, 200 meters, in forest, *Klug 2019;* a form with very large and lax inflorescence.

Psychotria lupulina Benth. in Hook. Journ. Bot. 3: 230. 1841.

A shrub, glabrous except in the inflorescence; stipules connate into a short, truncate sheath with short, subulate lobes; leaves grene

when dried, medium-sized or large, short-petiolate or subsessile, the blades ovate to elliptic or obovate, acuminate, rounded to acute at the base; inflorescence long-pedunculate, cymose-capitate, the bracts equaling the flowers, numerous, linear-lanceolate to ovate, acute to acuminate, usually red or reddish, the branches puberulent; calyx minutely dentate; corolla white, glabrous outside, 1 cm. long or less. Neg. 25795.

Loreto: Pebas, on the Amazon, in forest, *Williams 1813, 1812.* Caballo-cocha, in forest or clearings, *Williams 2289, 2232.* La Victoria, *Williams 2976, 2944, 2529, 2530.* Bolivia and Brazil to the Guianas.

Psychotria luxurians Rusby, Mem. Torrey Club 6: 50. 1896.

A shrub with glabrous branches; stipules triangular, short-bifid at the apex; leaves membranaceous, large, slender-petiolate, oblong-elliptic, long-acuminate, acute at the base, green or somewhat darkened when dried, minutely puberulent on the nerves; inflorescence laxly paniculate, 10–30 cm. long, pyramidal, the branches puberulent, somewhat deflexed, the flowers sessile or pedicellate; calyx teeth acute; corolla 4 mm. long, glabrous outside, the short lobes acute; fruit 3–4 mm. long. Neg. 614.

Reported by Rusby (loc. cit.) from Peru, *Mathews 1167.* I have seen also a specimen collected by Ruiz and Pavón, without locality. Bolivia, Ecuador, and Colombia.

Psychotria macrophylla R. & P. Fl. 2: 56. *pl. 202, f. a.* 1799.

Plants usually simple and suffrutescent, 1 meter high or less, or sometimes as much as 3 meters high, the stems glabrous or pruinose-puberulent; stipules short and soon deciduous, apiculate; leaves large, herbaceous, mostly green when dried, petiolate, the blades oblong to elliptic, acuminate, acute or attenuate at the base, glabrous or pruinose-puberulent beneath on the nerves; inflorescence axillary, on long or short peduncles, paniculate, short and few-flowered or often larger and many-flowered, usually lax, the branches often reflexed, the flowers sessile; bracts minute or small and inconspicuous; calyx denticulate; corolla greenish white or yellowish, glabrous, 4–5 mm. long; fruit white (reported also as red), 4–5 mm. long. Negs. 480, 511.

Huánuco: Type from Iscutuna, near Pillao, *Ruiz & Pavón* (photo. seen, ex hb. Berol.).—Junín: La Merced, 600 meters, in forest, *5515; Killip & Smith 23727, 23981.* San Nicolás, 1,100 meters, dense forest, *Killip & Smith 26025.* Cahuapanas, 340 meters, *Kil-*

lip & Smith 26713. East of Huacapistana, 2,100 meters, *Weberbauer 2110.*—Loreto: La Victoria, in forest, *Williams 3012, 3138, 2565.* Huallaga, Yurimaguas, *Williams 4669.* San Antonio, *Williams 3460.* Soledad, 110 meters, *Killip & Smith 29599.* Balsapuerto, *Killip & Smith 28578.*—San Martín: San Roque, in forest, *Williams 7194, 7630.* Cerro Campana, *Spruce 4317.* Moyobamba, *Mathews.* Bolivia to Central America, mostly at low elevations and in deep forest.

The species appears to be abundant in many parts of its range, and naturally exhibits a large amount of variation, especially in the shape of the leaves and form of the inflorescence. It may well be that the material referred here represents more than a single species, but I have been unable to discover any satisfactory basis for dividing it.

Psychotria Marcgraviella Standl. Field Mus. Bot. 8: 375. 1931.

A slender shrub 60 cm. high, the branchlets rusty-hispidulous; stipules linear-lanceolate, 3 mm. long, hispidulous; leaves blackening when dried, subsessile, membranaceous, oblong, 3–4.5 cm. long, 1–1.5 cm. wide, acute, broadly rounded and cordate at the base, rusty-pilosulous on the costa; inflorescence slender-pedunculate, cymose-corymbose, 3–4 cm. broad, lax and few-flowered, the branches glabrous, the glabrous pedicels 2–4 mm. long; calyx acutely 4-dentate; corolla ochroleucous, glabrous, 2.5 mm. long.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 494,* type.

Easily recognized by the small, sessile leaves with cordate bases.

Psychotria marginata Sw. Prodr. 43. 1788.

A nearly glabrous shrub 1–2 meters high; stipules large, brown, entire, caducous; leaves short-petiolate, darkening when dried, rather small, the blades obovate to obovate-oblong, acute or acuminate, attenuate to the base, minutely puberulent beneath or glabrate; inflorescence long-pedunculate, openly paniculate, many-flowered, with opposite or verticillate branches, the minute bracts deciduous, the pedicels 2–5 mm. long; calyx teeth short, obtuse; corolla yellowish white, scarcely 3 mm. long, glabrous outside; fruit globose, glabrous, 3–4 mm. long. Neg. 514.

Loreto: Masisea, 275 meters, open woods, *Killip & Smith 26840.* —San Martín: Mountains along Río Mayo, near Tarapoto, *Spruce 4875.* Pongo de Cainarachi, 230 meters, in forest, *Klug 2754.* Widely distributed in tropical America.

Resembling *P. alba*, but with conspicuously smaller flowers, usually on more elongate pedicels.

Psychotria Mathewsii Standl. Field Mus. Bot. 4: 342. 1929.

A shrub or small tree 2–4 meters, high, the branches glabrous or obscurely puberulent; stipules oval or broadly ovate, 1.5–2 cm. long or sometimes shorter, rounded at the apex, caducous; leaves rather thick, large, short-petiolate, darkening when dried, the blades obovate-oblong to oblong-elliptic, mostly 15–30 cm. long and 6–10 cm. wide, acute or acuminate, long-attenuate to the base, glabrous or minutely puberulent beneath on the veins; inflorescence short-pedunculate, cymose-paniculate, usually large and broad, lax and many-flowered, or dense at first, the branches minutely puberulent, the flowers sessile; calyx truncate or obsoletely denticulate; corolla greenish white, minutely puberulent outside, the tube 2 mm. long, not barbate in the throat; fruit red, subglobose, 4 mm. long.

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 23022, 22907*.—Junín: Colonia Perené, 600 meters, in forest, *Killip & Smith 25100, 24936*. Río Paucartambo Valley, 700 meters, *Killip & Smith 25262*. Chanchamayo, *Martinet*.—Loreto: Río Nanay, *Williams 378*. Caballo-cocha, in forest, *Williams 2362, 2473*. Tira Doble, *Williams 1062*. San Antonio, 110 meters, *Tessmann 3571*. Mishuyacu, *Klug 783*. San Martín: Moyobamba, *Mathews 1491*, type. Zepelacio, 1,200 meters, *Klug 3344*. Tarapoto, in forest, *Williams 6057, 5964; Spruce 4203*. Lamas, 840 meters, *Williams 6409, 6343*.—Without locality: *Martinet*. Also in Colombia. "Tapamaki."

Psychotria pongoana Standl., sp. nov.

Frutex vel arbor 2–6-metralis, ramulis crassiusculis vel gracilibus obtuse quadrangularibus in sicco fuscis pilosis vel glabris, internodiis elongatis; stipulae persistentes 1–2.5 cm. longae fuscae glabratae profunde bilobae, lobis semiovatis vel semilanceolatis acutis vel acuminatis erectis; folia magna breviter petiolata papyracea in sicco fuscescentia, petiolo 1–3 cm. longo piloso vel glabro; lamina oblongo-elliptica vel obovato-oblonga 13–22 cm. longa 5.5–8.5 cm. lata abrupte breviacuminata, basi cuneatim attenuata, supra glabra, costa nervisque non elevatis, subtus ad costam nervosque breviter molliter pilosula, aliter glabra vel glabrata, costa gracili elevata, nervis lateralibus utroque latere circa 11 obliquis arcuatis gracilibus prominentibus in marginem desinentibus, venulis inconspicuis laxe reticulatis; inflorescentia terminalis 5–15 cm. longe pedunculata

laxe bipinnatim paniculata pyramidalis, ramis oppositis gracilibus omnibus basi bracteatis divaricatis elongatis dense breviter pilosis, bracteis oblongis vel lanceolatis circa 1 cm. longis concavis obtusis vel acutis pilosulis, floribus in capitula dense multiflora circa 1 cm. diam. longe pedunculata dispositis, bracteis capitulorum ovalibus vel rotundatis 4–5 mm. longis apice rotundatis rigidis incurvis dense pilosulis vel glabratis; hypanthium cum calyce campanulatum strigosum 3 mm. longum, limbo truncato; corolla alba extus densissime villosula 9 mm. longa, tubo prope basin tenui prope medium abrupte expanso, lobis reflexis lanceolato-ovatis acutis vix 2 mm. longis intus puberulis; antherae inclusae.

Loreto: Florida, Río Putumayo, at mouth of Río Zubineta, 180 meters, in forest, *Klug 2337* (herb. Field Mus. No. 668,884, type). Sierra del Pongo, 600 meters, in undergrowth in tall forest, *Mexia 6269a.*—Cuzco: Prov. Paucartambo, *Weberbauer 6938.*—Colombia: Comisaría del Putumayo, Umbría, 325 meters, in forest, *Klug 1812.*

Psychotria microbotrys Ruiz ex Standl. Field Mus. Bot. 8: 204. 1930.

A shrub or tree 1–6 meters high, glabrous except in the inflorescence, with slender branches; stipules 14–17 mm. long, bifid, the segments lance-triangular, long-acuminate; leaves membranaceous, green when dried, the blades elliptic-oblong to broadly elliptic, 14–24 cm. long, 7–11 cm. wide, acute at each end; inflorescence long-pedunculate, broadly thyrsoid-paniculate, lax, many-flowered, 2–5 cm. long or larger, the branches spreading or broadly ascending or in age subreflexed, glabrous or sparsely and minutely puberulent, the flowers often subsecund, sessile or short-pedicellate; calyx lobes broadly rounded; corolla glabrous, white, 2.5 mm. long; fruit globose, 3 mm. long, acutely costate. Neg. 478.

Junín: Santa Rosa, 625–900 meters, dense forest, *Killip & Smith 26173.*—Loreto: La Victoria on the Amazon, in forest, *Williams 2983*, type. Santa Rosa, *Williams 4826.*—Without locality, *Ruiz.* Bolivia to Venezuela.

In the form of its inflorescence this species resembles closely some of the Palicoureas, but the corolla is that of a *Psychotria.*

Psychotria moyobambana Standl., sp. nov.

Frutex metralis omnino glaber, ramulis gracilibus rigidis, vetustioribus nigrescentibus teretibus, internodiis 2–4 cm. longis; stipulae persistentes basi in vaginam fere 2 mm. longam crassam connatae,

vagina in lacinias 4 remotas lineares acutas desinente; folia parva breviter petiolata subcoriacea, petiolo crassiusculo vix ultra 2 mm. longo; lamina oblonga vel lanceolato-oblonga 3.5–5.5 cm. longa 1–2 cm. lata acuta vel acuminata, basi obtusa vel acuta, supra in sicco olivacea costa prominente pallida, nervis obsoletis, subtus multo pallidior flavescens, costa gracili elevata, nervis lateralibus utroque latere circa 7 angulo lato adscendentibus prominulis tenerrimis arcuatis marginem incrassatum cartilagineum attingentibus, venulis obsoletis; inflorescentia terminalis graciliter 2–3 cm. longe pedunculata, e capitulis 4–5 longe pedunculatis dense paucifloris circa 6 mm. latis racemose dispositis composita 1.5–2 cm. longa et aequilata, ramis basi nudis, bracteis capitula fulcrantibus 3–5 mm. longis anguste oblongis vel anguste spathulatis acutis vel obtusis ut videtur viridibus plus minusve recurvis, floribus arcte sessilibus; hypanthium cum calyce circa 1 mm. longum, calyce remote inaequaliter dentato; corolla 3 mm. longa extus glabra, tubo lato obconico, lobis late ovatis obtusis tubo paullo longioribus, corolla in alabastro apice rotundato-obtusa.

San Martín: Zepelacio, near Moyobamba, 1,200–1,600 meters, in mountain forest, *Klug 3394* (herb. Field Mus. No. 736,801, type).

Psychotria nautensis Standl. Field Mus. Bot. 11: 242. 1936.

A tree 5.5 meters high, the branchlets glabrous; stipules persistent, suberect, 5–6 mm. long, glabrate, deeply bifid, the lobes semiovate, acute; leaves short-petiolate, subcoriaceous, narrowly oblanceolate-oblong, 18–28 cm. long, 6–7 cm. wide, long-acuminate or somewhat rounded and abruptly short-acuminate, long-attenuate to the base, glabrous, with about 13 pairs of nerves; inflorescence almost sessile, terminal, cymose-paniculate, laxly and diffusely branched, 15–20 cm. long and broad, the slender branches bracteate at the base, spreading or reflexed, densely and minutely pilose, the bracts 3–5 mm. long, lanceolate or oblong; flowers in few-flowered, small, bracted heads, the obtuse bracts 2–3 mm. long; hypanthium and calyx minutely pilose; corolla white, in bud 6–7 mm. long, very densely villosulous.

Loreto: Nauta, near the mouth of Río Ucayali, in forest, *Spruce 3863*, type.

Psychotria nigricans Standl. Field Mus. Bot. 8: 205. 1930.

A shrub or small tree, the branchlets densely puberulent; stipules bifid, the lobes triangular-lanceolate, attenuate; leaves short-petiolate, blackish when dried, membranaceous, the blades lanceolate to

elliptic-oblong, 12–24 cm. long, 4–9 cm. wide, long-acuminate, narrowed to the acute base, puberulent or short-pilosulous beneath on the veins; inflorescence pedunculate, very dense and many-flowered, about 2 cm. long and broad, composed of 5–9 dense, head-like cymes, the branches densely puberulent or pilosulous, the bracts foliaceous, lanceolate or linear-lanceolate, 5–8 mm. long; bractlets villous-ciliate; calyx 5-dentate; fruit ellipsoid, puberulent, 7–8 mm. long.

Loreto: Pebas, on the Amazon, in forest, *Williams 1603* (type), *1569*, *1777*, *1621*, *1570*. "Sonia."

Perhaps a *Palicourea* rather than a *Psychotria*.

Psychotria nudiceps Standl. Field Mus. Bot. 8: 378. 1931.

A shrub 1 meter high, almost wholly glabrous; stipules connate into a short-mucronate or subtruncate sheath; leaves short-petiolate, membranaceous, olivaceous when dried, the blades oblong or elliptic-oblong, 9–20 cm. long, 3–6.5 cm. wide, abruptly short-acuminate, narrowed to the base or abruptly contracted and decurrent; inflorescences terminal, sessile or pedunculate, capitate, the heads 1 cm. wide, densely many-flowered, the bracts none or minute; calyx 1 mm. long, truncate; corolla yellow, glabrous, acutish in bud, the tube 2.5 mm. long, barbate in the throat, the lobes slightly shorter.

Loreto: Punchana, in forest, *Williams 3775*. Mishuyacu, 100 meters, in forest, *Klug 278*, *306*.—San Martín: Tarapoto, *Williams 6600*, type.

Psychotria opima Standl. Field Mus. Bot. 11: 243, 1936.

A shrub a meter high, the branches glabrous; stipules persistent, connate into a very short sheath, with 4 setiform segments 7 mm. long; leaves short-petiolate, membranaceous, oblong-elliptic or broadly elliptic, 16–25 cm. long, 8–12 cm. wide, long-acuminate, obtuse at the base or rounded and abruptly contracted and short-decurrent, glabrous, with about 12 pairs of lateral nerves; inflorescence terminal, paniculate, 10 cm. long and 7 cm. wide, laxly many-flowered, trichotomous at the base, the slender branches densely puberulent, the flowers sessile in small cymes, the bracts minute; hypanthium and calyx together 1 mm. long, sparsely puberulent, the limb obscurely repand-denticulate; corolla yellowish, puberulent, minutely 5-corniculate at the apex, the tube 4 mm. long, not barbate in the throat, the 5 lobes oblong, glabrate within, half as long as the tube; anthers long-exserted.

Loreto: Lower Río Napo, in inundated forest, 100 meters, *Tessmann 3710*, type.

Psychotria patens Sw. Prodr. 45. 1788. *P. flexuosa* Willd. Sp. Pl. 1: 966. 1798.

A slender, glabrous shrub about 1 meter high, or reported also as a small tree; stipules short, green, biaristate; leaves small or medium-sized, usually yellowish green when dried, subcoriaceous, the blades lanceolate to lance-oblong, long-acuminate, obtuse or acute at the base; inflorescence pedunculate, thyrsoid-paniculate, often elongate, the short, slender branches reflexed; calyx lobes triangular; corolla whitish, glabrous, 7 mm. long; fruit white or pale blue, 3 mm. long. Neg. 549.

Junín: La Merced, 1,200 meters, in forest, *5605; Killip & Smith 23829*. Above San Ramón, 1,400–1,700 meters, *Killip & Smith 24694, 24623; Schunke A22*. Colonia Perené, 680 meters, *Killip & Smith 24932*. Florida, 180 meters, dense forest, *Klug 2282*. Chanchamayo Valley, 1,000 meters, *Schunke 65*.—Loreto: Iquitos, in forest, *Williams 3680, 3681; Tessmann 3638*. Alto Río Itaya, *Williams 3259*. Mouth of Río Santiago, *Tessmann 4509*.—San Martín: Tarapoto, *Williams 5612, 5886, 6728*. Zepelacio, 1,200 meters, *Klug 3331*. Lamas, *Mathews 1488*. Widely distributed in tropical America, usually in the lowland forests. "Gidoro-ey" (Huitoto name).

Psychotria pichisensis Standl. Field Mus. Bot. 8: 205. 1930.

A shrub or tree 7.5 meters high or less with glabrous branchlets; stipules oblong, acute, 6 mm. long, caducous; leaves short-petiolate, darkening when dried, the blades chartaceous, elliptic-oblong or oblanceolate-oblong, 12–17 cm. long, 4–5.5 cm. wide, acuminate, long-attenuate to the base, glabrous, with 11–13 pairs of nerves; inflorescence long-pedunculate, broadly pyramidal-paniculate, 10–17 cm. broad, the branches spreading or subreflexed, sparsely and minutely pilosulous or glabrate, the pedicels 2–4 mm. long; calyx truncate or remotely denticulate; fruit subglobose, 5 mm. long.

Junín: San Nicolás, 1,100 meters, dense forest, *Killip & Smith 25993*, type. Between Azupizú and Santa Rosa, 650 meters, *Killip & Smith 26138*.—Loreto: Mouth of Río Santiago, 160 meters, *Tessmann 4521*. Iquitos, 100 meters, *Tessmann 3558*.

Psychotria pilosa R. & P. Fl. 2: 60. *pl. 208, f. a.* 1799.

A shrub 3.5 meters high or less, or sometimes low and only suffrutescent, copiously pilose or hirsute throughout; stipules large,

persistent, bifid, the broad lobes acute or acuminate; leaves medium-sized, thin, dull green when dried, petiolate, the blades oblong-elliptic or ovate-oblong, acuminate, acute to obtuse at the base; inflorescence long-pedunculate, paniculate, at first dense or in age open, the flowers white, congested and subtended by conspicuous bluish bracts, the branches spreading or subreflexed; calyx acutely 5-dentate; fruit small, blue, pilose. Neg. 477.

Huánuco: Type from Cochero, *Ruiz & Pavón* (photo. seen, ex hb. Berol.). Cochero, *Poeppig 1446*.—Junín: Río Paucartambo Valley, 700 meters, dense forest, *Killip & Smith 25303, 25295*. Near La Merced, 800–1,300 meters, *Killip & Smith 23873*. Yapas, 1,400 meters, *Killip & Smith 25569*. Colonia Perené, 680 meters, *Killip & Smith 24934*. San Nicolás, 110 meters, *Killip & Smith 25995*.—Loreto: Pampas de Ponasa, *Ule 6775*.—San Martín: Zepelacio, 1,200–1,600 meters, mountain forest, *Klug 3445*. Río Mayo, near Tarapoto, *Spruce 4433*. Bolivia.

Psychotria pluriceps Standl. Field Mus. Bot. 11: 246. 1936.

A glabrous shrub; stipules persistent, connate into a sheath 1 mm. long, the 4 lobes narrowly triangular-oblong, acute; leaves short-petiolate, membranaceous, ovate-oblong or elliptic-oblong, 15–23 cm. long, 6–8.5 cm. wide, abruptly caudate-acuminate, acute at the base or abruptly contracted and cuneate-decurrent, the lateral nerves about 14 pairs; inflorescence terminal, small, short-pedunculate, capitate-paniculate, 2 cm. long and 3 cm. wide, with few spreading or subreflexed branches, the heads few-flowered, usually pedunculate, 4–6 mm. broad, the bracts green, spreading, oblong-triangular, acuminate; calyx 0.8 mm. long, truncate and remotely denticulate; corolla glabrous outside, 2.5 mm. long, the throat densely white-barbate.

Loreto: San Ramón, Yurimaguas, 200 meters, in forest, *Williams 4573*, type. Tira Doble, Alto Río Nanay, *Williams 1078, 1064*. "Mullaca."

Psychotria racemifera Standl. Field Mus. Bot. 8: 71. 1930.

A low, sometimes decumbent, glabrous shrub; stipules connate into a truncate sheath 2 mm. long, the subulate lobes 2–3 mm. long; leaves yellowish green when dried, coriaceous, short-petiolate, the blades elliptic-oblong or narrowly elliptic, 6–10 cm. long, 2–4 cm. wide, acuminate, acute or obtuse at the base, conspicuously marginate, inflorescence pedunculate, the sessile flowers capitate-congested, the heads racemose, the rachis minutely puberulent; outer bracts

oblong or linear, 2–5 mm. long, green; calyx shallowly dentate; corolla white, glabrous, 2.5–3 mm. long; fruit globose, 4–5 mm. long, reticulate-veined.

Loreto: Timbuchi, Río Nanay, in forest, *Williams 952.* Brazil, Venezuela, and Colombia.

Psychotria racemosa (Aubl.) Willd. Sp. Pl. 1: 966. 1797. *Nonatelia racemosa* Aubl. Pl. Guian. 1: 187. *pl. 72.* 1775.

A shrub 1–1.5 meters high with puberulent branches; stipules biparted, persistent, with stiff, subulate lobes 8–10 mm. long; leaves green when dried, short-petiolate, firm-membranaceous, the blades chiefly oblong-elliptic, medium-sized, short-acuminate, acute or abruptly contracted at the base, glabrous or nearly so; inflorescence short-pedunculate, thyrsiform, small and dense, minutely hirtellous, the flowers sessile; calyx lobes linear-lanceolate; corolla hirtellous; fruit 4–5-celled, 4 mm. long, at first orange-red, becoming black.

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 22893.*—Junín: Cahuapanas, 340 meters, *Killip & Smith 26721.* Santa Rosa, *Killip & Smith 26181.* Colonia Perené, 680 meters, *Killip & Smith 24927.* Near La Merced, *Killip & Smith 23865.* Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26496.* Río Paucartambo Valley, 700 meters, *Killip & Smith 25339.*—Loreto: Caballo-cocha, *Williams 2044, 2365.* Pebas, *Williams 1672, 1727, 1697, 1938.* La Victoria, *Williams 3085.* Yurimaguas, *Williams 3850; Killip & Smith 29047; Poeppig* in 1831. Fortaleza, *Williams 4255, 4353.* Paraíso, *Williams 3257.* San Antonio, *Williams 3440; Killip & Smith 29468.* Masana, *Williams 8169.* Río Acre, *Ule 9845.*—San Martín: Tarapoto, *Spruce 4543.* Widely distributed in tropical America.

A common species of wet lowland forests in many parts of tropical America. Easy to recognize by its normally 5-celled fruit.

Psychotria repanda R. & P. Fl. 2: 61. 1799.

A glabrous shrub; stipules connate at the base, lanceolate, ciliate on the margin and costa, caducous; leaves petiolate, the blades lanceolate or oblong-lanceolate, repand; flowers sessile, paniculate-racemose, the racemes elongate, the branches compressed, subtended by small, ovate, acute bracts; calyx minute, 5-dentate; corolla minute, yellow, villous in the throat; fruit purple, as large as a peppercorn.

Huánuco: Described from Cochero and Chinchao, *Ruiz & Pavón.*

Known to the writer only from the original description, which is not accompanied by a plate. This species is not included in the key. The description suggests a plant of the alliance of *Psychotria patens*, but this is a mere guess.

Psychotria reticulata R. & P. Fl. 2: 56. *pl. 212, f. b.* 1799. *Rudgea valida* Rusby, Mem. Torrey Club 6: 51. 1896.

A shrub, the stout branchlets with a short, dense, velvety pubescence; stipule lobes 1 cm. long, linear; leaves large or medium-sized, yellowish when dried, subcoriaceous, short-petiolate, the blades oblong-ovate to oblong-elliptic, abruptly acuminate, obtuse at the base, rough above, densely velvety-pubescent beneath; inflorescence pedunculate, pyramidal, cymose-paniculate, the primary branches subtended by long, narrow bracts, the flowers sessile in very dense cymes; calyx teeth ovate, acute; corolla 6 mm. long, yellow, pilose.

Amazonas: Yambrasbamba, *Mathews 1494*.—Huánuco: Type from Pillao, *Ruiz & Pavón* (photo. seen, ex hb. Berol.). Bolivia.

Psychotria retifera Standl. Field Mus. Bot. 4: 342. 1929.

Branchlets tomentulose; stipules connate, 2–3 mm. long, very shortly bilobate, the lobes rounded; leaves short-petiolate, dark when dried, thick-coriaceous, the blades elliptic or broadly elliptic, 3–5.5 cm. long, 1.7–3 cm. wide, acute, rounded or obtuse at the base, glabrous, with closely reticulate, prominent venation; inflorescence pedunculate, thyrsoid-paniculate, 1–3 cm. long, dense, many-flowered, the branches densely puberulent, the flowers sessile or subsessile; calyx subtruncate, tomentulose; corolla 5 mm. long, tomentulose; fruit subglobose, 8 mm. long.

Huánuco: Between Huánuco and Pampayacu, *Kanehira 247*, type.

The plant may be a *Palicourea* rather than a *Psychotria*, since it has been impossible to determine satisfactorily the floral details.

Psychotria rhodophylla Standl. Field Mus. Bot. 8: 194. 1930.

A shrub 1–4.5 meters high, the branchlets glabrous or minutely pilosulous; stipule sheath 1–2.5 mm. long, the lobes linear-subulate, 2.5–5 mm. long; leaves short-petiolate or almost sessile, bright green when dried, often reddish beneath, at least on the veins, the blades elliptic-oblong to elliptic, 11–30 cm. long, 5–15 cm. wide, acute or short-acuminate, acute to obtuse at the base, glabrous or nearly so; inflorescence head-like, short-pedunculate, 4.5–5 cm. broad or in fruit broader, the primary branches fastigiate, puberulent, the

outer bracts 13–20 mm. long, red-nerved, puberulent or glabrate; calyx subtruncate; corolla blue, glabrous, the tube 12 mm. long, not barbate in the throat; fruit deep purple, depressed-globose, 6 mm. long, smooth.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 289* (type), *370*. Fortaleza, Yurimaguas, 200 meters, in forest, *Williams 4354, 4120, 4258, 3880; Poeppig 2083*. Mainas, *Poeppig 1083B, 2083B*. San Antonio, 110 meters, *Killip & Smith 29441*. Between Yurimaguas and Balsapuerto, *Killip & Smith 28084*. Paraíso, *Williams 3258*.—San Martín: Tarapoto, *Williams 6589*. Pongo de Cainarachi, 230 meters, in forest, *Klug 2646*.

Psychotria rhodothamna Standl. Field Mus. Bot. 8: 201. 1930.

A shrub or small tree, 1–6 meters, high, glabrous except in the inflorescence; stipules 2–3 mm. long, appressed, the short lobes ovate-triangular, obtuse; leaves green when dried, short-petiolate, the blades thick-membranaceous, lance-oblong to oblong-elliptic, 9–19 cm. long, 3–8 cm. wide, cuspidate-acuminate, acute or short-acuminate at the base, the lateral nerves about 8 pairs; inflorescence pedunculate, depressed-cymose, 1.5–3 cm. broad, dense, many-flowered, the branches ebracteate at base, puberulent or glabrous, reddish when dried, the flowers sessile or short-pedicellate; calyx truncate or obsoletely denticulate; corolla white or ochroleucous, pulverulent or glabrate, the tube 8–14 mm. long, the obtuse lobes 2.5–3 mm. long; fruit apparently blue, didymous, 5–6 mm. broad, smooth.

Loreto: Iquitos, 100 meters, in woods, *Killip & Smith 27115* (type), *26925, 27344*. Pisco, in forest, *Williams 1286*. Pebas, on the Amazon, *Williams 1591, 1664, 1678*. Yurimaguas, edge of forest, *Williams 3906*. San Antonio, Alto Itaya, *Williams 3491; Killip & Smith 29334, 29341*. Mishuyacu, 100 meters, *Klug 741*. Bolivia to Venezuela.

Psychotria rufescens H. & B. (*P. micrantha* HBK.). The original locality of *P. micrantha* is given doubtfully as Peru, but that of *P. rufescens*, which probably was based upon the same collection, is reported as the Río Magdalena in Colombia. The species, apparently, should be excluded from any list of the Peruvian flora.

Psychotria rugulosa HBK. The locality of this species, likewise, was given originally as perhaps Peruvian, but the plant seems to be rather a species of Ecuador and Colombia.

Psychotria Ruizii Standl. Field Mus. Bot. 7: 313. 1931.

A nearly glabrous shrub 2 meters high; stipules bifid almost to the base, the lobes rigid, linear-attenuate; leaves short-petiolate, bright green when dried, firm-membranaceous, the blades oblong-ovate to elliptic, 10–19 cm. long, 4–8 cm. wide, acute or acuminate, at the base contracted and decurrent, the lateral nerves about 7 pairs; inflorescence pedunculate, head-like, 1–2 cm. broad, erect or subrecurved, the peduncle puberulent, pilosulous, or glabrate; outer bracts green, rounded, 6 mm. long; calyx deeply lobate, the segments triangular-subulate; corolla white; fruit glabrous, subglobose, 3.5 mm. long. Neg. 472.

Huánuco: Chicoplaya, *Ruiz.*—Loreto: Fortaleza, 140 meters, in forest, *Klug 2826.* Bolivia.

Psychotria santaremica Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 328. 1881.

A slender shrub 1–4.5 meters high, glabrous or almost so, sometimes obscurely puberulent on the leaf veins; stipules short, the lobes subulate; leaves medium-sized, short-petiolate, green when dried, the blades ovate to lanceolate or elliptic-oblong, long-acuminate, abruptly contracted and decurrent at the base, with 8–11 pairs of nerves; inflorescence short-pedunculate, umbellately few-rayed, the branches naked at the base, the flowers in head-like clusters, sometimes all congested into a single head; basal bracts linear and greatly elongate; calyx 5-dentate; branches of the inflorescence pink; corolla ochroleucous or yellow; fruit globose, 4 mm. long, white or pale blue (reported also as purple). Neg. 6103.

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 22873.*—Junín: Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26413.* Puerto Yessup, 400 meters, *Killip & Smith 26251, 26283.*—Loreto: Iquitos, 100 meters, *Killip & Smith 29853.* Masisea, 275 meters, open woods, *Killip & Smith 26847.* Río Napo near Mazán, *Mexia 6451.* Yurimaguas, 135 meters, *Killip & Smith 28022.* Santa Rosa, *Killip & Smith 28766.* Peña Blanca, *Killip & Smith 29649.*—San Martín: Juan Jui, *Klug 3909.* Pongo de Cainarachi, *Klug 2741.* San Roque, in forest, *Williams 6937, 7408, 7700.* Also in Amazonian Brazil and in Colombia. "Mullaca."

Psychotria semimetralis Krause, Notizbl. Bot. Gart. Berlin 8: 102. 1922.

An epiphytic shrub about 50 cm. high, glabrous; stipules connate into a sheath 2–2.5 mm. long, dentate at the apex; leaves short-

petiolate, coriaceous, the blades lanceolate or lance-oblong, 3.5–5.5 cm. long, 1.2–1.8 cm. wide, acute or acuminate, narrowed at the base; inflorescence pedunculate, small, few-flowered, about equaling the leaves, the flowers short-pedicellate; calyx lobes ovate-lanceolate, acute; corolla pale yellow, the tube 5–6 mm. long, the lobes scarcely half as long. Neg. 470.

San Martín: Mountains east of Moyobamba, 1,500 meters, *Weberbauer 4751*, type (photo. and fragm. seen, ex hb. Berol.). Cerro de Campana, *Spruce*.

The Spruce collection was referred by the writer to *Psychotria lassula* Standl., but there seems to be no reason for segregating it from the Krause species, and *P. lassula*, as pertains to the type specimen, likewise may not be separable. Both species belong to a small group of epiphytic plants, whose forms are closely related, and it remains to be seen how many of the proposed species can be maintained when ample material is available for consideration.

Psychotria stenostachya Standl. Field Mus. Bot. 8: 207. 1930.

A shrub or tree 1–7.5 meters high, the branchlets appressed-pilosulous or glabrate; stipule sheath 4–6 mm. long, the linear-subulate lobes 5–9 mm. long; leaves usually dark when dried, short-petiolate, thick-membranaceous, the blades elliptic, oblong-elliptic, or obovate-elliptic, mostly 14–25 cm. long and 5–12 cm. wide, abruptly acuminate, acute or abruptly acute at the base or sometimes attenuate, puberulent or appressed-pilosulous beneath along the veins or glabrate; inflorescence pedunculate, 4–10.5 cm. long, 8–15 mm. wide, composed of numerous sessile or short-pedunculate cymes, these few- or many-flowered, the branches ferruginous-tomentose, the bracts inconspicuous; calyx truncate or unequally dentate; corolla greenish white, tomentulose or glabrate, 5-tuberculate at the apex in bud, the tube 5 mm. long, not barbate in the throat; fruit orange, subglobose, 6 mm. long, 5-celled.

Junín: Near Puerto Yessup, 400 meters, dense forest, *Killip & Smith 26220*.—Loreto: San Antonio, 110 meters, dense forest, *Killip & Smith 29294* (type), *29346*, *28413*, *29419*. Puerto Arturo, *Williams 5078*, *5293*. Fortaleza, edge of forest, *Williams 4307*, *4251*. Recreo, *Williams 4135*. Yurimaguas, *Williams 3890*. Paraíso, *Williams 3329*, *3238*. Pebas, *Williams 1606*. Foothills of Sierra del Pongo, *400* meters, *Mexia 6186*. Balsapuerto, *Killip & Smith 28516*. Santa Rosa, *Killip & Smith 28755*. Soledad, *Killip & Smith 29574*, *29767*. Between Yurimaguas and Balsapuerto, 140 meters,

Killip & Smith 28160.—San Martín: Río Mayo, *Spruce 4383.* Tarapoto, in forest, *Williams 6095.* Pongo de Cainarachi, 230 meters, in forest, *Klug 2697.* Ecuador.

A member of the subgenus *Nonatelia*, and related, therefore, to *P. racemosa.*

Psychotria striolata Krause, Notizbl. Bot. Gart. Berlin 6: 209. 1914.

A nearly glabrous shrub 1–3 meters high; stipules broadly ovate, acuminate, 10–12 mm. long, caducous; leaves short-petiolate, the blades membranaceous, oblong to ovate-oblong, 12–18 cm. long, 5–7 cm. wide, with 17–20 pairs of nerves, acuminate, attenuate at the base; inflorescence small and rather few-flowered, short-pedunculate; calyx minutely denticulate; corolla white or greenish, 2.5 mm. long, the lobes shorter than the tube. Neg. 460.

Loreto: San Francisco on the Río Acre, *Ule 9844*, type (photo. seen, ex hb. Berol.).

Psychotria subtomentosa R. & P. Fl. 2: 61. *pl. 210, f. a.* 1799. *Cephaelis subtomentosa* Spreng. Syst. Veg. 1: 749. 1825.

A shrub or small tree with stout, hirsute branches; stipules large, bifid, with elongate, linear lobes; leaves subcoriaceous, yellowish green or sometimes darkening when dried, petiolate, the blades lance-oblong or elliptic-oblong, medium-sized, long-acuminate, acute at the base, copiously pilose; inflorescence sessile or pedunculate, trifid, the flowers sessile in large, dense, head-like clusters; calyx 5-dentate; corolla blue, villous.

Huánuco: Described from Chinchao, Mesapata, and Maichainigo, *Ruiz & Pavón.*—Junín: Chanchamayo Valley, *Schunke 298, 397.*

Psychotria tarapotensis Standl. Field Mus. Bot. 8: 377. 1931.

A slender, nearly glabrous shrub; stipules biparted, the segments linear, green; leaves sessile, firm-membranaceous, green when dried, elliptic or elliptic-oblong, 6.5–12 cm. long, 2.5–5.5 cm. wide, abruptly acuminate, acute at the base; inflorescence slender-pedunculate, capitate, the peduncle glabrous or hispidulous, the head densely few-flowered, or composed of 4 heads, the outer bracts apparently green, 10–14 mm. long, lanceolate; calyx remotely denticulate; corolla hispidulous, the tube 5 mm. long.

San Martín: Tarapoto, 750 meters, *Williams 5888* (type), *5867, 6497.*

Psychotria tenuicaulis Krause, Notizbl. Bot. Gart. Berlin 8: 101. 1922.

A slender shrub or small tree 1–6 meters high, the young branches pilose; stipules ovate-lanceolate, 3–4 mm. long, acute, deciduous; leaves short-petiolate, thin, lanceolate or oblong-lanceolate, mostly 5–9 cm. long and 2–3 cm. wide, acuminate, acute or obtuse at the base, sparsely pilose beneath, at least along the costa; inflorescence slender-pedunculate, lax, few-flowered, 3–5 cm. long, trichotomous or verticillately branched at the base, the flowers slender-pedicellate; calyx acutely denticulate; corolla white or ochroleucous, 3–3.5 mm. long; fruit small, deep red. Neg. 471.

Huánuco: Between Monzón and the Huallaga, 600 meters, *Weberbauer 3663*, type (photo. and fragm. seen, ex hb. Berol.). Cochero, dense forest, *Poeppig 1067*.—Junín: Cahuapanas, 340 meters, *Killip & Smith 26719*. San Nicolás, 1,100 meters, dense forest, *Killip & Smith 25999*.—Loreto: Mainas, *Poeppig 2445B*. Puerto Arturo, 160 meters, in forest, *Williams 5292, 5217; Killip & Smith 27735*. Fortaleza, Yurimaguas, edge of forest, *Williams 4283, 4438*. Río Itaya, *Williams 232*. Santa Rosa, 135 meters, *Killip & Smith 28887*. Also in Colombia.

Psychotria Tessmannii Standl. Field Mus. Bot. 4: 341. 1929.

A rather slender shrub 1–3.5 meters high, with glabrous branchlets; stipule lobes subulate, 6–8 mm. long or more; leaves usually blackening when dried, rather thin, short-petiolate, the blades elliptic to elliptic-oblong, chiefly 7–20 cm. long and 3–8 cm. wide, long-acuminate, acute at the base or abruptly contracted and decurrent, sparsely and minutely puberulent beneath on the veins; inflorescence pedunculate, narrowly paniculate, elongate, raceme-like, the sessile flowers in small, pedunculate cymes, the branches minutely puberulent; calyx obsoletely obtuse-dentate; corolla white or ochroleucous, minutely puberulent or glabrate, the tube 2.5 mm. long; fruit bright orange.

Junín: San Nicolás, 1,100 meters, dense forest, *Killip & Smith 25994*.—Loreto: Río Ucayali, *Tessmann 3014*, type. Río Masana, in forest, *Williams 205*. Santa Rosa, 135 meters, *Killip & Smith 28777*. Río Putumayo, in forest, *Klug 1625*. Florida, 200 meters, in forest, *Klug 1975*. San Antonio, 110 meters, *Killip & Smith 29321*. Mouth of Río Tigre, wooded bank, *Killip & Smith 27521*. Iquitos, *Killip & Smith 27186, 27460*. Río Itaya, *Killip & Smith*

29287. Peña Blanca, *Killip & Smith 29657.*—San Martín: Base of Cerro Campana, *Spruce 4383.* Ecuador.

Psychotria tinctoria R. & P. Fl. 2: 62. *pl. 211, f. a.* 1799. *Palicourea tinctoria* R. & S. Syst. Veg. 5: 194. 1819.

An almost glabrous shrub or small tree 3–6 meters high, with stout branches; stipules large, persistent, deeply bilobate, the broad lobes obtuse; leaves subcoriaceous, petiolate, yellowish green when dried, the blades broadly elliptic to elliptic-oblong, large, obtuse or acute, acute to almost rounded at the base; inflorescence paniculate, pedunculate, rounded-pyramidal, rather small, subappressed-pilose, the stout branches spreading, chiefly opposite, subtended at the base by large bracts; calyx 5-dentate; corolla sericeous, hirsute in the throat, reddish yellow, or yellowish white with deeper yellow lobes; fruit large, subglobose, reddish. Neg. 649.

Huánuco: Described from Macora and Mesapata, *Ruiz & Pavón* (photo. of authentic specimen seen, ex hb. Berol.).—Junín: Yapas, 1,400 meters, dense forest, *Killip & Smith 25492.* Eneñas, 1,700 meters, dense forest, *Killip & Smith 25640.*—Without locality: *Fielding.*

Psychotria trifida R. & P. Fl. 2: 60. *pl. 209, f. b.* 1799.

A nearly glabrous shrub; stipules bifid, small, with short, acute lobes, persistent; leaves thick, shining above, short-petiolate, darkening when dried, the blades oblong or oblong-oblanceolate, small, acuminate, acute at the base, pilose beneath along the costa; inflorescence terminal, trichotomous, sessile, the flowers in small, dense, head-like clusters; calyx 5-dentate; corolla sparsely pubescent, hirsute in the throat; fruit black. Neg. 486.

Huánuco: Type collected between Acomayo and Cerro Carpish, *Ruiz & Pavón* (photo. and fragm. seen, ex hb. Berol.). Cochero, *Poeppig 1527.*

Psychotria Victoriae Standl. Field Mus. Bot. 8: 191. 1930.

A shrub or tree 6 meters high or less, the branches puberulent or glabrous; stipules 5–8 mm. long, short-bilobate, the lobes obtuse or rounded; leaves petiolate, firm, green or rather dark when dried, the blades oblong or elliptic-oblong, 14–20 cm. long, 5–8.5 cm. wide, abruptly short-acuminate, narrowed to the base, glabrous beneath or pilosulous on the veins, the nerves about 13 pairs; inflorescence long-pedunculate, composed of 4–7 racemose heads, the peduncles spreading, glabrous or short-pilose, bracteate at the base, the dense

heads 1–2 cm. in diameter; outer bracts broadly rounded, ciliate, deep purple; calyx appressed-pilose, 2–4 mm. long, truncate; fruit apparently blue, 4–5 mm. long, pilose about the apex.

Junín: San Nicolás, 1,100 meters, dense forest, *Killip & Smith 26013*. Puerto Yessup, 400 meters, dense forest, *Killip & Smith 26255*.—Loreto: La Victoria, on the Amazon, in forest, *Williams 3080*, type. Iquitos, *Williams 8228*.

Psychotria villosa R. & P. Fl. 2: 59. *pl. 207, f. a.* 1799.

A shrub about 2 meters high, the branches ferruginous-villous or hirsute; stipules ovate, acute, caducous; leaves petiolate, oblanceolate-oblong, sometimes 25 cm. long but usually much smaller, acuminate, attenuate to the base, rusty-villous or hirsute, especially beneath; inflorescence pedunculate, corymbose-paniculate, lax and open, the basal branches opposite or verticillate; calyx 5-dentate; corolla 3 mm. long, glabrous outside; fruit red, glabrous, 4 mm. long. Neg. 485.

Huánuco: Described from Chinchao and Cochero, *Ruiz & Pavón*. Posuso, 600 meters, in forest, *4709*. Pampayacu, *Kanehira 23*. Casapí, *Fielding 1947*. Cochero, *Fielding 1948*.—Ayacucho: Aina, 750–1,000 meters, open woods, *Killip & Smith 22524, 23136*.—San Martín: San Roque, 1,400 meters, *Williams 7520, 7336*. Río Mayo, *Spruce 4372*.—Without locality: *Poeppig 1568*.

Psychotria virgata R. & P. Fl. 2: 60. *pl. 209, f. a.* 1799.

A glabrous shrub with stout branches; stipules short, persistent, bilobate, with rounded lobes; leaves small, coriaceous, short-petiolate, lance-oblong to elliptic, acute or short-acuminate, acute or subobtuse at the base, conspicuously veined; inflorescence cymose-paniculate, sessile or pedunculate, puberulent or glabrate, the flowers sessile or nearly so; bracts small and inconspicuous; calyx 5-dentate; corolla yellow, hirsute in the throat; fruit oval, dark blue. Neg. 484.

Huánuco: Described from Sircai and Soria, near Pillao and Muña, *Ruiz & Pavón* (photo. and fragm. seen, ex hb. Berol.).—San Martín: Chiliquín, *Mathews 1493*.

Ruiz and Pavón state that the dried leaves were employed for dyeing yellow. The species should probably be referred rather to the genus *Palicourea*.

Psychotria viridis R. & P. Fl. 2: 61. *pl. 210, f. b.* 1799. *P. glomerata* HBK. Nov. Gen. & Sp. 3: 362. 1820. *Palicourea viridis* R. & S. Syst. Veg. 5: 195. 1819.

A shrub or small tree, 4.5 meters high or less, glabrous or nearly so; stipules large, thin, acuminate, ferruginous, caducous; leaves darkening when dried, thin, short-petiolate, obovate or obovate-oblong, small or medium-sized, acute or short-acuminate, cuneate-attenuate to the base; inflorescence pedunculate, spicate-paniculate, open, many-flowered, the minute flowers sessile in distant glomerules; corolla greenish white; fruit red, 4–5 mm. long. Neg. 482.

Huánuco: Described from Chinchao and Macora, *Ruiz & Pavón.* —Junín: Colonia Perené, 600 meters, in forest, *Killip & Smith 25150.* Puerto Bermúdez, 375 meters, *Killip & Smith 26641.*— Loreto: San Ramón, in forest, *Williams 4567.* Fortaleza, Yurimaguas, *Williams 4276.* Paraíso, *Williams 3363.* Balsapuerto, *Killip & Smith 28383.* Santa Rosa, *Williams 4836.* Puerto Arturo, 135 meters, *Killip & Smith 27763, 27871.* Between Yurimaguas and Balsapuerto, *Killip & Smith 28264.*—San Martín: Tarapoto, *Williams 6699, 6030; Ule 6614.* Casapí, *Fielding 1949.* Zepelacio, 1,200 meters, in forest, *Klug 3377.* Rumizapa, *Williams 6812.* Río Mayo, *Williams 6278, 6228, 6203.* Bolivia to Central America and Cuba: Amazonian Brazil.

"Paufil chaqui." The original locality of *P. glomerata* was given doubtfully as Peru, but it is more probable that the type came from Colombia.

Psychotria Weberbaueri Standl. Field Mus. Bot. 8: 192. 1930.

A tree 8 meters high, glabrous or nearly so; stipules caducous, triangular, obtuse, 3 mm. long; leaves petiolate, rather thick, darkening when dried, the blades broadly elliptic or ovate-elliptic, 13–25 cm. long, 6.5–16 cm. wide, acute or abruptly apiculate-acuminate, at the base obtuse to subtruncate and abruptly long-decurrent, with about 25 pairs of nerves; inflorescence terminal or pseudo-axillary, cymose-paniculate, broadly pyramidal, lax, many-flowered, 11 cm. broad, verticillate-branched at the base, the branches glabrous; pedicels 1–3 mm. long; calyx truncate; corolla greenish white, 5 mm. long, glabrous.

Junín: La Merced, 1,000 meters, *Weberbauer 1872,* type.

Psychotria Williamsii Standl. Field Mus. Bot. 8: 200. 1930.

A shrub 2–2.5 meters high, nearly glabrous; stipules short-connate, the lobes 4–5 mm. long, subulate-linear; leaves sessile, firm, green when dried, narrowly oblong or lance-oblong, 13–22 cm. long, 3–6 cm. wide, very long-acuminate, rounded and shallowly cordate at the base; inflorescence long-pedunculate, depressed-cymose,

almost head-like, 5 cm. broad, the very short branches naked at the base, minutely puberulent or glabrous; bracts deep purple, elliptic-oblong to lanceolate or oblanceolate, 1.5–2.5 cm. long, acute to cuspidate-acuminate, puberulent or glabrate; calyx with very short, rounded lobes; corolla pale blue, minutely puberulent, 8 mm. long; fruit 5 mm. long.

Loreto: Río Nanay, in forest, *Williams 760* (type), *763*. Peña Blanca on Río Itaya, 110 meters, dense forest, *Killip & Smith 29648*. "Brocha sisa."

Psychotria yapasensis Standl. Field Mus. Bot. 8: 196. 1930.

A glabrous shrub or tree 2.5–6 meters high; stipule sheath 1.5–3 mm. long, truncate, the lobes triangular, acute, 1–2 mm. long; leaves short-petiolate, coriaceous or thinner, the blades elliptic-ovate or oblong-elliptic, 9–24 cm. long, 4–10 cm. wide, obtuse or acute, at the base acute or subobtuse; inflorescence long-pedunculate, broadly pyramidal-paniculate, lax, many-flowered, the opposite branches bracted at the base, spreading or subreflexed, the flowers sessile; calyx truncate or minutely denticulate; corolla yellowish, glabrous, 7 mm. long.

Junín: Yapas, 1,350–1,600 meters, dense forest, *Killip & Smith 25461* (type), *25567*.

Psychotria zepelaciana, Standl., sp. nov.

Frutex 3-metralis, ramulis crassiusculis densissime pilis brevibus patentibus ferrugineis pilosis, internodiis brevibus; stipulae caducae non visae; folia magna petiolata crasse membranacea in sicco fuscescentia, petiolo crassiusculo 2–5 cm. longo densissime ferrugineo-pilosulo; lamina elliptica vel oblongo-elliptica 14–21 cm. longa 5.5–10.5 cm. lata et ultra abrupte breviacuminata, acumine triangulari acuto, basi acuta vel cuneato-attenuata, supra opaca glabra nervis manifestis, subtus vix pallidior ubique ad costam densius breviter pilosa vel villosula, costa crassiuscula elevata, nervis lateralibus utroque latere circa 17 angulo fere recto abeuntibus leviter arcuatis prominentibus in marginem desinentibus, venulis paucis obscuris; inflorescentia terminalis crasse 2 cm. longe pedunculata cymoso-paniculata dense multiflora circa 7 cm. longa et 9 cm. lata e basi radiatim ramosa, ramis crassis divaricatis densissime breviter ferrugineo-pilosis, bracteis minutis deciduis, floribus sessilibus dense aggregatis; hypanthium cum calyce 2 mm. longum dense ferrugineo-pilosulum obconicum, calyce brevi truncato; corolla ochroleuca dense breviter pilosula 5 mm. longa, tubo lato fauce dense barbato, lobis

oblongo-triangularibus tubo paullo longioribus acutiusculis intus minute puberulis; antherae oblongo-lineares subexsertae, stylo antheris longiore.

San Martín: Zepelacio, near Moyobamba, 1,100 meters, in forest, *Klug 3733* (herb. Field Mus. No. 753,164, type).

73. PALICOUREA Aubl.

Shrubs or small trees; leaves opposite or ternate, membranaceous or coriaceous; stipules small or large, persistent, bilobate, the lobes broad or narrow; flowers cymose, corymbose, or paniculate, the panicles often thyrsoid, the branches of the terminal inflorescence usually colored; calyx small, dentate; corolla tubular, with very short lobes, the tubes commonly more or less curved and somewhat dilated on one side at the base; fruit drupaceous, 2–5-celled.

The genus is close to *Psychotria*, and is not distinguished from it by any constant character, nevertheless *Palicourea* is a convenient group, and the species usually may be distinguished by their general aspect from all the Psychotrias. Some of the species listed below may be better referable to *Psychotria* than to *Palicourea*, but their proper status can not be settled satisfactorily without more ample material than is now available. The species are not so well differentiated as those of *Psychotria* usually are, and the following key will not be found altogether satisfactory for their separation.

Corolla densely villous, large, the hairs completely covering its outer surface and often tufted. Leaves opposite, often very large.

Leaves densely or sparsely pilose beneath.

Leaves glabrous on the upper surface; corolla about 2.5 cm. long ..... *P. lachnantha.*

Leaves densely pubescent on the upper surface; corolla 1.5 cm. long or less ..... *P. lasiophylla.*

Leaves glabrous or practically so.

Ovary narrowly turbinate, attenuate to the base, not clearly jointed with the pedicel ..... *P. lasiantha.*

Ovary companulate, obtuse or rounded at the base, evidently jointed with the pedicel ..... *P. condensata.*

Corolla glabrous, puberulent, or sparsely short-villous, often small.

Inflorescence corymbose or cymose, with strongly ascending branches, often fastigiately branched, or small and few-flowered, usually as broad as long or broader.

Leaves evidently pubescent beneath, at least along the costa or on the nerves, sometimes minutely puberulent.

Peduncles several times as long as the small, fastigiately branched inflorescence. Leaves minutely puberulent. *P. stenoclada.*

Peduncles little if at all longer than the inflorescence, often much shorter.

Branches glabrous.

Leaves scaberulous on the upper surface, 2 cm. wide or less..... *P. consobrina.*

Leaves glabrous on the upper surface, mostly 3.5–7.5 cm. wide..... *P. bracteosa.*

Branches pilose or villous.

Leaves coriaceous; calyx lobes short, obtuse.. *P. Lechleri.*

Leaves membranaceous; calyx lobes acute.

Inflorescence dark purple when dry, the bracts lanceolate..... *P. Herrerae.*

Inflorescence yellowish when dried, the bracts subulate. *P. Buchtienii.*

Leaves glabrous beneath.

Stipule lobes broad, obtuse. Leaves blackish when dried. *P. nigricans.*

Stipule lobes usually narrow, acute or acuminate.

Leaf blades small, 18 mm. wide or less..... *P. saligna.*

Leaf blades larger, mostly 3–10 cm. wide.

Calyx lobes linear, much elongate..... *P. cymosa.*

Calyx lobes short and broad.

Inflorescence lax and open, the branches spreading, the flowers long-pedicellate..... *P. ponasae.*

Inflorescence dense, the branches suberect, the flowers sessile or short-pedicellate.

Primary branches of the inflorescence subtended at the base by bracts..... *P. punicea.*

Primary branches without bracts at the base.

Bracts of the inflorescence minute and obscure. *P. corymbifera.*

Bracts linear or spatulate, conspicuous.

Inflorescence dark purple when dried; leaves about 11 cm. wide.....*P. lucidula.*

Inflorescence yellowish when dried; leaves 3.5–6.5 cm. wide.....*P. lucentifolia.*

Inflorescence paniculate or thyrsiform, sometimes spike-like, usually longer than broad and many-flowered, the branches not fastigiate, often spreading.

Inflorescence elongate, spike-like, the primary branches suppressed or very short and often appressed.

Leaves blackish when dried, mostly 8–12 cm. wide; flowers spreading or ascending.....*P. subspicata.*

Leaves green or yellowish green when dried, mostly 3–5 cm. wide; flowers suberect.....*P. charianthema.*

Inflorescence not spike-like, the primary branches usually elongate.

Leaves all or chiefly ternate. Inflorescence elongate-thyrsiform; corolla pubescent.....*P. triphylla.*

Leaves opposite.

Leaves glabrous beneath.

Corolla sparsely pilose or villosulous with spreading hairs. *P. Raimondii.*

Corolla glabrous or finely puberulent.

Peduncles and branches of the inflorescence pubescent, sometimes minutely so.

Corolla in bud with 5 wart-like projections at or near the apex.

Corolla with 5 wart-like projections at its apex. *P. levis.*

Corolla with wart-like projections at the base of the lobes.....*P. aphthosa.*

Corolla without wart-like projections near the apex.

Corolla glabrous; leaves narrowly lanceolate. *P. attenuata.*

Corolla puberulent or minutely sericeous; leaves broader.

Corolla minutely sericeous; leaves mostly 4–6 cm. wide.....*P. mitis.*

Corolla coarsely puberulent; leaves mostly 7–13 cm. wide..... *P. macrophylla.*

Peduncles and branches of the inflorescence glabrous or practically so.

Leaves very large, as much as 30 cm. long and 12 cm. wide. Stipule lobes short, approximate, obtuse; inflorescence dense, globose-thyrsoid. *P. Klugii.*

Leaves much smaller, rarely more than 15 cm. long.

Inflorescence dense, the flowers in head-like clusters..... *P. Jelskii.*

Inflorescence lax and open.

Leaf blades broadly obovate, coriaceous; corolla minutely puberulent..... *P. sulphurea.*

Leaf blades narrowly oblong or lanceolate to narrowly elliptic; corolla glabrous.

Leaf blades narrowly lanceolate or linear-lanceolate, 2–3 cm. wide.. *P. sandiensis.*

Leaf blades elliptic-oblong to narrowly elliptic, usually wider.

Leaves bright green when dried, with prominent venation, lustrous beneath. *P. crocea.*

Leaves usually blackish when dried, the veins obscure, dull beneath. *P. paraensis.*

Leaves sparsely or densely pubescent beneath, at least pilose on the veins or costa.

Branches sharply quadrangular. Corolla glabrous. *P. perquadrangularis.*

Branches terete or subterete.

Stipules very large, 2–4 cm. long.

Leaves densely short-hirsute beneath; hypanthium hispidulous..... *P. Kanehirae.*

Leaves pilose beneath on the veins; hypanthium glabrous or puberulent.

Leaves with about 13 pairs of nerves; bracts narrowly linear..... *P. longistipula.*

Leaves with about 20 pairs of nerves; bracts lanceolate to ovate.....*P. Macbridei.*

Stipules small, rarely more than 1 cm. long.

Corolla sparsely or densely pilose with more or less elongate, spreading hairs, these sometimes very few.

Inflorescence small, dense, compact; corolla very sparingly pilose.....*P. punoensis.*

Inflorescence large, lax, open, much elongate; corolla densely or sparsely pilose.

Veins of the leaves prominent beneath and reticulate; corolla 7–8 mm. long, sparsely pilose.....*P. chrysotricha.*

Veins of the leaves obscure; corolla 10–14 mm. long.....*P. macrobotrys.*

Corolla glabrous or minutely puberulent.

Leaf blades narrowly oblong or lanceolate; stipule lobes elongate-subulate.....*P. angustifolia.*

Leaf blades ovate to elliptic or broadly obovate, rarely oblong, but the stipule lobes then short and broad.

Leaves densely and softly pubescent beneath. Corolla 6–8 mm. long...*P. chlorocaerulea.*

Leaves sparsely pilose beneath, chiefly along the costa.

Corolla 14–19 mm. long. Stipule lobes semi-ovate, obtuse.....*P. polyneura.*

Corolla 8–12 mm. long.

Stipules united to form a truncate sheath, the linear lobes remote. Corolla 9–12 mm. long.....*P. Weberbaueri.*

Stipules bilobate, the lobes commonly approximate.

Leaves with about 18 pairs of nerves, the blades broadly obovate..*P. obovata.*

Leaves with 10–12 pairs of nerves.

Stipules 4–5 mm. long.....*P. latifolia.*

Stipules larger, usually 6–10 mm. long.

Leaf blades acuminate.
P. amethystina.
Leaf blades rounded and apiculate at the apex.....*P. Haenkeana.*

Palicourea amethystina (R. & P.) DC. Prodr. 4: 527. 1830. *Psychotria amethystina* R. & P. Fl. 2: 57. *pl. 203, f. b.* 1799.

A shrub 2–3 meters high, or reported even as a tree of 4.5 meters, the stout branchlets villosulous at first but soon glabrate; stipule sheath loose, 5–8 mm. long, the shorter lobes narrowly triangular, usually obtuse; leaves short-petiolate, coriaceous, elliptic to lance-oblong, 10–16 cm. long, acute or acuminate, acute at the base, short-villous or pilose beneath on the veins; panicles pedunculate, thyrsoid or narrowly pyramidal, many-flowered, the short, stout branches spreading or somewhat reflexed, pilose or glabrate; calyx lobes minute, obtuse; corolla blue or purplish, glabrous, 8–12 mm. long; fruit oval, purple or black. Neg. 531.

Huánuco Described from Pillao and Huasahuasi, *Ruiz & Pavón* (two specimens of authentic material seen in hb. Kew., also photos. and fragments from hb. Berol.). Yanano, 1,800 meters, *3719.* Muña, trail to Tambo de Vaca, 2,400 meters, *4299.* Muña, 1,800–2,400 meters, *Pearce* in 1863.—Junín: Porvenir, 1,500–1,900 meters, dense forest, *Killip & Smith 25944.* Bolivia.

Palicourea angustifolia HBK. Nov. Gen. & Sp. 3: 367. 1820.

A slender shrub or small tree, sometimes 5 meters high, the young branchlets densely puberulent; stipule sheath 4–6 mm. long, the lobes erect, equaling or longer than the sheath, linear-subulate; leaves short-petiolate, oblong or oblong-lanceolate, 6–20 cm. long, long-acuminate, obtuse or acute at the base, puberulent or pilose beneath, at least on the veins; panicle pedunculate, thyrsoid, open or dense, the branches pilose or puberulent; flowers pedicellate; calyx minute, acutely dentate; corolla 10–15 mm. long, puberulent or short-pilose, purple or purplish; fruit 4–5 mm. long, purple-black. Neg. 577.

Cajamarca: Tambillo, *Jelski 373; Raimondi 7041* (both in hb. Berol.). Also in Ecuador, Colombia, and Venezuela.

The Peruvian specimens seem referable to this common northern species, which is not known otherwise south of the mountains of Colombia.

Palicourea aphthosa Standl. Field Mus. Bot. 11: 224. 1936.

A shrub 2 meters high, the young branchlets densely ochraceous-pilosulous; stipules 3–4 mm. long, the short lobes triangular, obtuse;

leaves short-petiolate, coriaceous, the blades lance-oblong, 6–8.5 cm. long, 1.5–3 cm. wide, short-acuminate, glabrous or nearly so; inflorescence pedunculate or sessile, leafy-bracted at the base, thyrsoid-paniculate, dense, many-flowered, 4–7 cm. long, the branches puberulent, the flowers sessile; calyx acutely 5-dentate; corolla yellow, 5–6 mm. long, glabrous or glabrate, the lobes slightly shorter than the tube.

Huánuco: Mountains southwest of Monzón, 2,500–2,900 meters, *Weberbauer 3401*, type.

Palicourea attenuata Rusby, Bull. N. Y. Bot. Gard. 4:371. 1907.

A shrub 2–3 meters high, the branches glabrous; stipule sheath 2–3 mm. long, truncate, the distant lobes triangular; leaves short-petiolate, narrowly lance-oblong, 10–30 cm. long, 3–7 cm. wide, long-acuminate, glabrous; panicles thyrsoid, pedunculate, puberulent, 6–9 cm. long, dense, the branches spreading or even reflexed, the flowers sessile; calyx teeth minute and obscure; corolla 5 mm. long, orange-yellow, glabrous; fruit didymous-globose, 5 mm. long, nearly smooth.

Without locality, *Mathews 1947*. Also in Bolivia.

Palicourea bracteosa Standl. Field Mus. Bot. 8: 222. 1930.

A shrub or small tree 2–6 meters high, the branches glabrous; stipule sheath truncate, 3–4 mm. long, the lobes linear-subulate, remote, 4–5 mm. long; leaves short-petiolate, thick-membranaceous, the blades oblanceolate-oblong, 12–21 cm. long, 3.5–7.5 cm. wide, abruptly acuminate, glabrous above, thinly pilosulous beneath or glabrate; inflorescence sessile or pedunculate, depressed-cymose, dense, 4–11 cm. wide, the branches pilosulous, the bracts purple, oblong or obovate, the flowers sessile and finally more or less secund; calyx teeth broadly triangular, acutish; corolla white, densely pilose, 9 mm. long; fruit densely short-pilose.

Junín: In dense forest, Puerto Bermúdez, 375 meters, *Killip & Smith 26419*, type. Amazonian Brazil.

Palicourea Buchtienii Standl. Field Mus. Bot. 7: 317. 1931.

A slender shrub 1 meter high, the branches densely hirtellous; stipules ovate, 3–8 mm. long, the lobes approximate, linear-attenuate; leaves short-petiolate, small, the blades elliptic-oblong, 4–10 cm. long, 1.5–4 cm. wide, acuminate, minutely soft-puberulent; inflorescences pedunculate, corymbiform, 3–5.5 cm. wide, densely many-flowered, the branches divaricate or ascending, hirtellous, the

flowers sessile or short-pedicellate; calyx lobes acute; corolla 12 mm. long, sparsely villosulous, blue; fruit villosulous, 4 mm. long.

Junín: Mountains west of Huacapistana, 2,700 meters, *Weberbauer 2280*. Río Masamerich, 2,500 meters, *Weberbauer 6674*. Bolivia.

Palicourea caerulea (R. & P.) R. & S. Syst. Veg. 5: 194. 1819. *Psychotria caerulea* R. & P. Fl. 2: 62. *pl. 213, f. b.* 1799.

A glabrous shrub; stipules ovate, entire; leaves opposite, short-petiolate, lanceolate, long-acuminate, acute at the base, large; panicles sessile, open, many-flowered, the branches spreading or ascending, the bracts ovate; flowers sessile in dense clusters; calyx minute, 5-dentate; corolla funnelform, 12 mm. long, yellowish; fruit blue.

Junín: The species was based upon a drawing of a plant growing at Vitoc, sent by Tafalla to Ruiz and Pavón.

The species is not included in the key. If the original description and illustration are correct in ascribing entire stipules to the plant, it is not a species of *Palicourea*, and the illustration suggests a *Psychotria*. Since probably no specimen of the species was preserved, it is likely to remain unplaced.

Palicourea charianthema Standl. Field Mus. Bot. 8: 226. 1930.

A slender shrub 1–3.5 meters high, the branchlets minutely puberulent; stipule sheath truncate, the linear, acute lobes 1–1.5 mm. long; leaves membranaceous, short-petiolate, the blades green when dried, oblong-lanceolate, 8–15 cm. long, 3–5 cm. wide, long-acuminate, glabrous above, minutely pilose beneath along the costa or glabrous, with about 12 pairs of nerves; inflorescence long-pedunculate, apparently pendent or recurved, raceme-like or spike-like, 10–22 cm. long and scarcely 2 cm. wide, the rachis puberulent, the flowers pedicellate; calyx lobes acute or acuminate; corolla 15 mm. long, sparsely short-pilose.

Loreto: Banks of Río Itaya above Iquitos, 110 meters, wooded banks, *Killip & Smith 29395*, type. Paraíso, *Williams 3302*. Iquitos, in forest, *Williams 3678; Killip & Smith 27187, 27012*. Peña Blanca, *Killip & Smith 29658*. Amazonian Brazil.

The inflorescence is variously described as light or dark red or as orange-red. The species is related to *P. macrobotrys*, but differs conspicuously in its exceedingly narrow inflorescence.

Palicourea chlorocaerulea Krause, Bot. Jahrb. 40: 339. 1908.

A shrub 3 meters high, the branches more or less ferruginous-pilosulous; stipule lobes triangular, acute, slightly shorter than the tube; leaves short-petiolate, coriaceous, brownish when dried, the blades obovate or obovate-lanceolate, 8–13 cm. long, 3.5–5 cm. wide, acuminate, paler and sparsely short-pilose beneath, especially on the veins; panicle pyramidal, 8–10 cm. long, pedunculate, open, the stiff branches puberulent, the flowers short-pedicellate; calyx minute, 5-dentate; corolla greenish blue, minutely puberulent or almost glabrous, 6–8 mm. long; fruit 4–5 mm. long. Neg. 581.

Cajamarca: Tambillo, *Raimondi 6189.*—Huánuco: Mountains southwest of Monsón, 2,500–2,900 meters, *Weberbauer 3406* (photo. and fragm. of type seen, ex hb. Berol.).

Palicourea chrysotricha (Zahlbr.) Standl. Field Mus. Bot. 11: 226. 1936. *Psychotria chrysotricha* Zahlbr. Ann. Naturh. Hofmus. Wien 7: 1. 1892.

Branchlets short-pilose; stipule sheath 4–7 mm. long, the lobes short, subulate, remote; leaves on short, slender petioles, thick-membranaceous, the blades elliptic or oblong, 20–25 cm. long, 8–11 cm. wide, sparsely short-pilose beneath, the nerves about 20 pairs; inflorescence pedunculate, narrowly pyramidal-paniculate, 20 cm. long, open, short-pilose with golden hairs; calyx teeth broadly ovate, acutish; corolla bluish, short-villosulous, 7–8 mm. long. Neg. 582.

Cajamarca: Tambillo, *Jelski 374,* type collection (photo. and fragm. seen, ex hb. Berol.); *Raimondi 4773.*

Palicourea condensata Standl. Field Mus. Bot. 8: 224. 1930. *P. pachycalyx* Standl. loc. cit.

A shrub or small tree, 6 meters high or less, the branchlets glabrous, stout; stipule lobes 8 mm. long, oblong, obtuse; leaves large, short-petiolate, membranaceous, the blades elliptic or oblong-elliptic, blackish green when dried, 20–34 cm. long, 9–15 cm. wide, very shortly acuminate, glabrous, with 13–17 pairs of nerves; inflorescence pedunculate, cymose-paniculate or broadly thyrsoid, dense and many-flowered, the stout and often angled branches bright red, puberulent, the bracts linear or oblong, the flowers on short, thick pedicels; hypanthium glabrous or minutely puberulent; calyx lobes short, obtuse; corolla rose or purplish red, 16 mm. long, thick, densely villous-tomentose; fruit 6–9 mm. long. Neg. 587.

Loreto: Yurimaguas, 135 meters, in woods, *Killip & Smith 28048* (type), *27607; Williams 3800, 7834.* Iquitos, *Williams 8002;*

Killip & Smith 27225. Middle Río Blanco, *Tessmann 3027*. Lower Nanay, *Williams 440*. Punchana, in forest, *Williams 3754*. Mishuyacu, *Klug 50*. Mainas, *Poeppig* (photo. ex hb. Berol.). Balsapuerto, 150–350 meters, *Killip & Smith 28571*. San Lorenzo, *Killip & Smith 29208*. Caballo-cocha, in forest, *Williams 2078* (type of *P. pachycalyx*). Rancho Indiana, 110 meters, border of forest, *Mexia 6441a*. Río Putumayo, *Klug 1628*. Paraíso, *Williams 3284*. Santa Rosa, *Killip & Smith 28952*.—San Martín: Near Tarapoto, *Spruce 4150*. Lamas, *Williams 6338*. San Roque, in forest, *Williams 6985*.—Without locality, *Mathews 1490*. Also in Brazil and Bolivia.

The species is close to *P. lasiantha*, with which I have confused it in naming collections, but it appears fairly distinct by the characters given in the key. The corolla ordinarily is much thicker and stouter than in *P. lasiantha*.

Palicourea consobrina Standl. Field Mus. Bot. 4: 339. 1929.

A slender shrub with glabrous branchlets; stipule sheath 2–3 mm. long, the linear lobes half as long; leaves small, green when dried, short-petiolate, membranaceous, the blades elliptic-oblong or lance-oblong, 3.5–6 cm. long, 1–2 cm. wide, long-acuminate, minutely scaberulous above, appressed-pilosulous beneath, especially on the veins; inflorescence red, slender-pedunculate, dense and few-flowered, 1–1.5 cm. long and broad, the lowest bracts often foliaceous, the flowers crowded, pedicellate; calyx lobes oblong-linear, 3.5–4.5 mm. long; corolla purple, 9 mm. long, glabrous.

Cuzco: In forest, Pillahuata, Cerro de Cusilluyoc, 2,300 meters, *Pennell 13988*, type.

Palicourea corymbifera (Muell. Arg.) Standl. Field Mus. Bot. 7: 127. 1930. *Psychotria corymbifera* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 247. *pl. 35*. 1881.

A shrub or tree 2–7.5 meters high, the branches glabrous; leaves quaternate, short-petiolate, thick-membranaceous, more or less lustrous; stipule sheath short, with minute teeth; blades elliptic-oblong to linear-lanceolate, 15–30 cm. long, long-acuminate, minutely puberulent on the veins or almost glabrous; inflorescence fastigiate, umbelliform, 6–11 cm. broad, the lowest branches verticillate, yellow, suberect, finely puberulent; calyx very minutely denticulate; corolla violet or red, 8 mm. long, minutely puberulent or almost glabrous; fruit 5 mm. broad.

Loreto: Mishuyacu, in forest, *Klug 1311*. Also in Amazonian Brazil, Venezuela, and French Guiana.

Palicourea crocea (Sw.) R. & S. Syst. Veg. 5: 193. 1819. *Psychotria crocea* Sw. Prodr. Veg. Ind. Occ. 44. 1788. *Psychotria thyrsiflora* R. & P. Fl. 2: 57. *pl. 204, f. b.* 1799. *Palicourea thyrsiflora* DC. Prodr. 4: 528. 1830.

A slender, nearly glabrous shrub or small tree, sometimes 7.5 meters high, with a trunk 7.5 cm. in diameter; stipules 3–5 mm. long, the short lobes linear or subulate; leaves short-petiolate, green when dried, firm-membranaceous, the blades ovate-oblong or elliptic-oblong, 6–15 cm. long, acuminate, glabrous or nearly so; panicles sessile or pedunculate, pyramidal, many-flowered, open, the ascending or spreading branches glabrous or minutely puberulent, the bracts minute; flowers usually long-pedicellate; calyx lobes minute, ovate or rounded; corolla yellow to orange or red, 8–12 mm. long, glabrous; fruit 4–5 mm. long. Neg. 643.

Ayacucho: Carrapa, 1,500 meters, *Killip & Smith 30672, 22358, 23203.*—Huánuco: Type of *Psychotria thyrsiflora* from Cochero; photo. seen of specimen in hb. Berol. Casapí, *Fielding 447.* Pampayacu, *Sawada 24.*—Junín: Pangoa, *Mathews 1167.* Chanchamayo Valley, 1,200 meters, *Schunke 285.* Eneñas, 1,700 meters, dense forest, *Killip & Smith 25729, 25750.* Yapas, 1,500 meters, *Killip & Smith 25594.* Río Pinedo, *Killip & Smith 23658.*—Loreto: Sierra del Pongo, 650 meters, *Mexia 6271.*—San Martín: San Roque, *Williams 7528, 6949, 7051.* Moyobamba, *Weberbauer 4553.* Widely distributed in tropical America, from Bolivia and Argentina northward.

Palicourea cymosa (R. & P.) Standl. Field Mus. Bot. 11: 226. 1936. *Psychotria cymosa* R. & P. Fl. 2: 59. *pl. 206, f. b.* 1799.

A nearly glabrous shrub; stipules biparted, the lobes remote, linear-subulate; leaves petiolate, firm-membranaceous, the blades elliptic-oblong, acuminate, acute at the base, glabrous; inflorescence pedunculate, cymose-paniculate, short and dense, the bracts subulate to oblong; calyx lobes 5, subulate to oblong, elongate; fruit oval, violet. Neg. 502.

Huánuco: Described from Chacahuasi and Pampamarca, near Pillao, *Ruiz & Pavón* (photo. and fragm. seen, ex hb. Berol.). Río Huallaga near Cochero, in forest, *Poeppig 1739.*

Psychotria flavescens HBK. was ascribed doubtfully to Peru, but it appears to be rather an Ecuadorian species.

Palicourea Haenkeana DC. Prodr. 4: 530. 1830. *Cinchona Haenkeana* Bartl. ex DC. loc. cit. in syn.

Stipules triangular, acute; leaves petiolate, oval, about 21 cm. long and 10.5 cm. wide, rounded and shortly produced at the apex, abruptly contracted at the base, thin, pilose beneath, especially along the nerves, with about 11 pairs of nerves, these conspicuous, the lowers ones divergent at almost a right angle, the upper at an acute angle, the veins prominent and reticulate; panicle pedunculate, thyrsoid-pyramidal, 14 cm. long, the rachis very stout, the branches ascending or spreading, the flowers pedicellate; bracts deciduous; corolla purplish, glabrous, 8 mm. long.

Type from "Peruviae montanis Oronoccensibus" (probably Huánuco), collected by Haenke.

The only material I have seen is a specimen in the herbarium of the Missouri Botanical Garden, which apparently is an authentic one—from the Bernhardi Herbarium. The plant represented is probably only a somewhat abnormal form of *P. amethystina*, and therefore was collected in the mountains of Peru. The leaves—there is a single one with the specimen mentioned—appear to be somewhat abnormal. In Palicourea the leaves nearly always are acute or acuminate.

Palicourea Herrerae Standl. Field Mus. Bot. 4: 339. 1929.

A shrub or small tree, the slender branches short-hispidulous; stipule sheath 2–3 mm. long, the lobes narrowly triangular, acute, 1 mm. long; leaves small, green, short-petiolate, firm-membranaceous, the blades elliptic-oblong, 4.5–6 cm. long, 1–2 cm. wide, long-acuminate, scabrous above, whitish-hispidulous beneath; inflorescence cymose-paniculate, dense, few-flowered, 1–2 cm. long and wide, the branches hispidulous, the bracts subulate; flowers sessile or subsessile; calyx lobes lance-oblong, acuminate; corolla purple, 10 mm. long, hispidulous; fruit 5 mm. long, sparsely pilose.

Cuzco: Thicket above Pillahuata, Cerro de Cusilluyoc, 2,800–3,100 meters, *Pennell 14130*, type.

Palicourea Jelskii Standl. Field Mus. Bot. 8: 221. 1930.

A tree, the branchlets minutely puberulent; stipules 1 cm. long, bifid, the lobes broadly lance-oblong, acute; leaves slender-petiolate, firm, the blades narrowly oblong or oblanceolate-oblong, 11–12 cm. long, 3–4 cm. wide, acute or short-acuminate, glabrous, with 15 pairs of nerves; inflorescence sessile or short-pedunculate, dense, 2–2.5 cm. long, composed of few dense, racemose heads, the branches glabrous, the flowers sessile; calyx lobes obtuse or rounded; corolla in bud only 3.5 mm. long, glabrous, minutely 5-tuberculate at the apex.

Cajamarca: Tambillo, *Jelski 357*, type; *Raimondi 4962*.

The plant may be more properly referable to the genus *Psychotria*.

Palicourea Kanehirae Standl. Field Mus. Bot. 4: 337. 1929.

A small tree, the branches densely long-pilose; stipules oblong, 2.5–3.8 cm. long, shallowly bilobate, the lobes acute; leaves petiolate, the blades broadly elliptic or rounded-obovate, 14–21 cm. long, 9–12 cm. wide, rounded and cuspidate at the apex, narrowed and obtuse at the base, hispidulous or glabrate above, densely short-hirsute beneath, with about 19 pairs of nerves; inflorescence pedunculate, pyramidal-paniculate, 9–11 cm. long, the branches densely pilose, the flowers pedicellate; calyx lobes 2.5–3.5 mm. long, oblong or ovate, obtuse or subacute; corolla 9 mm. long, sparsely pilosulous.

Huánuco: Pampayacu, *Kanehira 18*, type.

Palicourea Klugii Standl. Field Mus. Bot. 11: 228. 1936.

A tree 5 meters high, almost wholly glabrous; stipules 6–8 mm. long, bilobate, the lobes very obtuse; leaves short-petiolate, blackish when dried, firm, the blades lance-oblong, 24–35 cm. long, 8–12 cm. wide, short-acuminate, with about 14 pairs of nerves; inflorescence globose-thyrsoid, short-pedunculate, dense, many-flowered, 6 cm. long, the pedicels mostly 1–1.5 cm. long; calyx annuliform, obsoletely denticulate; corolla lilac, glabrous, 17 mm. long.

Loreto: Florida, Río Putumayo, 200 meters, in forest, *Klug 1977*, type.

The collector reports the vernacular name as "parinari," but this probably is an error.

Palicourea lachnantha Standl. Field Mus. Bot. 11: 228. 1936.

A shrub 4 meters high, the branches glabrous or nearly so; stipules 8–10 mm. long, bifid almost to the base, the lobes linear-lanceolate, attenuate; leaves large, blackish when dried, firm-membranaceous, short-petiolate, the blades lance-oblong, 22–25 cm. long, 7–8 cm. wide, puberulent above on the veins, short-pilose beneath on the veins, the nerves about 15 pairs; inflorescence cymose, short-pedunculate, densely many-flowered, about 5 cm. long, the branches densely pilose, the flowers sessile or short-pedicellate; hypanthium villous; calyx lobes linear-lanceolate, villous, 3 mm. long; corolla 2.5 cm. long, densely long-pilose, red-violet.

Loreto: Florida, Río Putumayo, 200 meters, in forest, *Klug 1973*, type.

Palicourea lasiantha Krause, Bot. Jahrb. 40: 341. 1908. *P. irrasiflora* Wernham, Journ. Bot. 55: 280. 1917.

A shrub 1–2 meters high, nearly glabrous; stipules 4–7 mm. long, bifid, the lobes rounded; leaves large, rather firm, often blackish when dried, petiolate, oblong to elliptic, chiefly 20–30 cm. long, short-acuminate, glabrous or nearly so; inflorescence thyrsoid-paniculate, large, usually open, long-pedunculate, the branches spreading or ascending, puberulent or glabrate, the flowers pedicellate; calyx lobes ovate, acutish; corolla purple or pink, 1.5–2 cm. long, densely villous-tomentose. Neg. 609.

Huánuco: Between Monsón and Río Huallaga, open forest, 600 meters, *Weberbauer 3599*, type (photo. and fragm. seen, ex hb. Berol.).—Junín: La Merced, 600–1,200 meters, *5497*, *5737*. Chanchamayo Valley, 1,000–1,500 meters, *Schunke 333*, *1735*, *430*.—Loreto: Masisea, 275 meters, open woods, *Killip & Smith 26836*. Pampa de Sacramento, *Castelnau* in 1847.—Puno: *Raimondi 10975*. Also in Bolivia.

Killip and Smith report the vernacular name as "jaboncillo," and state that the leaves are "used as a soap," a report that probably is not applicable to the present plant.

Palicourea lasiophylla Krause, Bot. Jahrb. 40: 340. 1908. *P. villosiflora* Standl. Field Mus. Bot. 8: 222. 1930.

A shrub or tree 2–10 meters high, the young branches fulvous-pilose; stipule sheath 4–5 mm. long, the lobes lance-linear, 7–8 mm. long; leaves green when dried, firm, short-petiolate, the blades lance-oblong, 12–30 cm. long, 4–7 cm. wide, acuminate, rough-pilosulous above, pilose beneath, with about 18 pairs of nerves; inflorescence pedunculate, depressed-cymose, dense and many-flowered, 5 cm. wide, the branches villous-pilose, the bracts linear, the flowers sessile; calyx teeth triangular, acute; corolla white or pink, 10–16 mm. long, densely villous. Neg. 607.

Cajamarca: Tambillo, *Raimondi 5899*.—Junín: Schunke Hacienda above San Ramón, 1,500 meters, dense forest, *Killip & Smith 24568*, type of *P. villosiflora*.—Loreto: Mountains north of Moyobamba, in forest and thickets, 1,400 meters, *Weberbauer 4643*, type (photo. and fragm. seen, ex hb. Berol.).—San Martín: Zepelacio, 1,200–1,600 meters, mountain forest, *Klug 3424;* a shrub of 2 meters; flowers dark violet.

Palicourea latifolia Krause, Bot. Jahrb. 40: 338. 1908.

A shrub or small tree 5 meters high, the branchlets sparsely puberulent; stipules broadly ovate, 4–5 mm. long, incised at the apex; leaves slender-petiolate, firm-herbaceous, the blades obovate-elliptic, 14–17 cm. long, 7–10 cm. wide, short-acuminate, sparsely short-pilose beneath, especially on the veins; panicles pedunculate, pyramidal, 20 cm. long or less, lax, the branches sparsely puberulent, the flowers short-pedicellate; calyx minute, obsoletely denticulate; corolla blue, 12 mm. long, glabrous. Neg. 606.

Huánuco: Mountains southwest of Monsón, 1,700 meters, *Weberbauer 3564*, type (photo. and fragm. seen, ex hb. Berol.).

Probably only a form of *P. amethystina*.

Palicourea laxa (R. & P.) R. & S. Syst. Veg. 5: 195. 1819. *Psychotria laxa* R. & P. Fl. 2: 61. *pl. 212, f. b.* 1799. *Psychotria luteo-virens* Pers. Syn. Pl. 1: 208. 1805.

A glabrous shrub; stipules short, bifid, the lobes ovate, obtuse; leaves short-petiolate, oblong-elliptic, large, acuminate, at the base acute or obtuse; panicles elongate, pedunculate, recurved in fruit, the primary bracts foliaceous, lanceolate, the flowers pedicellate; calyx minute, 5-dentate; corolla yellowish green, slender, funnelform; fruit purplish green, ovoid, subdidymous.

Based upon a drawing and description sent to Ruiz and Pavón by Tafalla from San Antonio de Playa Grande.

In spite of the description of the plant as glabrous, it seems probable, after examination of the plate, that this is a synonym of *Palicourea macrobotrys*. Since probably no specimen of the species is preserved, it will be difficult to place it satisfactorily. It is not included in the key.

Palicourea Lechleri Standl. Field Mus. Bot. 4: 338. 1929.

A shrub, the branchlets densely short-pilose; stipule sheath 1–2 mm. long, the lobes linear; leaves short-petiolate, coriaceous, yellowish green when dried, the blades elliptic-oblong or ovate-oblong, 3–5 cm. long, 1.5–2 cm. wide, long-acuminate, acute or obtuse at the base, minutely scaberulous above, hispidulous beneath; inflorescence sessile or short-pedunculate, cymose-corymbose, 1.5–2 cm. long, densely few-flowered, the branches yellow-hispidulous, the flowers sessile or subsessile; hypanthium hispidulous; calyx lobes oblong, obtuse; fruit glabrate, 3–3.5 mm. long.

Puno: Tatanara, *Lechler 2610*, type.

Palicourea levis Standl. Field Mus. Bot. 4: 336. 1929.

A shrub or tree 2–6 meters high, the branches glabrous or minutely puberulent; stipule sheath 1.5–2.5 mm. long, the lobes linear or triangular, 1.5–2 mm. long; leaves short-petiolate, firm-membranaceous, the blades oblong or elliptic-oblong, 6–11 cm. long, 2–4 cm. wide, acute or short-acuminate, obtuse or abruptly contracted at the base, sometimes minutely barbate beneath in the axils of the nerves, otherwise glabrous; inflorescence small, dense, many-flowered, pedunculate or sessile, thyrsoid-paniculate, 3–7 cm. long, the branches minutely puberulent or hirtellous, the flowers sessile, congested; calyx teeth short, obtuse; corolla white or yellowish, minutely puberulent, 5–6 mm. long; fruit 6 mm. broad, didymous, glabrous.

Ayacucho(?): Huaicani, 3,000–3,300 meters, *Pearce* in 1866.—San Martín: Mount Guairapurina, near Tarapoto, *Spruce 4062*, type. Also in Ecuador.

Palicourea longistipula Standl. Field Mus. Bot. 4: 336. 1929.

Branchlets glabrous, or the youngest bifariously pilosulous; stipules 2–3.5 cm. long, bifid, the segments semiovate, acuminate; leaves short-petiolate, coriaceous, the blades elliptic or oblong-elliptic, 11–18 cm. long, 4–9 cm. wide, long-acuminate, yellowish green, sparsely scaberulous above, hispidulous beneath on the veins; inflorescence thyrsoid-paniculate, pedunculate, 5 cm. long, dense, the branches hispidulous, the flowers sessile, densely congested; calyx lobes minute, acute; corolla 5–6 mm. long, sparsely puberulent or glabrate.

Puno: Tatanara, *Lechler 2622*, type.

Palicourea lucentifolia Standl. Field Mus. Bot. 8: 223. 1930.

A shrub, glabrous outside the inflorescence; stipule sheath truncate, the linear-attenuate lobes 4–5 mm. long; leaves opposite, almost sessile, firm-membranaceous, lustrous, yellow-green, lance-oblong or narrowly oblong-lanceolate, 10–18 cm. long, 3.5–5.5 cm. wide, long-acuminate; inflorescence corymbose, umbelliform, long-pedunculate, 10 cm. broad, the fastigiate branches suberect, minutely puberulent; bracts linear or subulate, 4–10 mm. long, the flowers more or less secund, sessile or short-pedicellate; calyx minute, obsoletely denticulate.

Loreto: Edge of forest, La Victoria on the Amazon, *Williams 2906*, type.

Palicourea lucidula Standl. Field Mus. Bot. 8: 225. 1930.

A shrub with glabrous branches; stipule sheath 1.5–2.5 mm. long, the lobes remote, linear-subulate, 4–5 mm. long; leaves very shortly petiolate, bright green, membranaceous, the blades elliptic-oblong, 29–32 cm. long, 11 cm. wide, acuminate, glabrous, with about 20 pairs of nerves; inflorescence cymose-paniculate, fastigiately branched, dense, long-pedunculate, 6 cm. long, the thick branches minutely puberulent or almost glabrous, the bracts foliaceous, lanceolate or narrowly spatulate, 5–10 mm. long, the flowers sessile or short-pedicellate, more or less secund; fruit globose or somewhat didymous, 4–5.5 mm. wide, glabrous, the carpels almost smooth.

Loreto: Santa Rosa, 135 meters, dense forest, *Killip & Smith 28816*, type. Between Yurimaguas and Balsapuerto, dense forest, *Killip & Smith 28089*.

Branches and bracts reddish brown to purple.

Palicourea Macbridei Standl. Field Mus. Bot. 4: 338. 1929.

A shrub or small tree, the stout branchlets glabrous; stipules 2–3.5 cm. long, ovate, acuminate, cordate at the base; leaves short-petiolate, subcoriaceous, the blades elliptic or elliptic-oblong, 16–32 cm. long, 6–14 cm. wide, abruptly short-acuminate, glabrous above except along the costa, brownish beneath, short-hirsute on the veins; inflorescence thyrsoid-paniculate, pedunculate, dense, 8 cm. long, the branches sparsely pilosulous or glabrate, the bracts ovate or oblong, the flowers sessile or short-pedicellate; calyx lobes short, obtuse; fruit globose, 5 mm. long, costate.

Huánuco: Cuschi, 1,500 meters, in rain forest, *Macbride 4821*, type.

Flowers described as metallic purple.

Palicourea macrobotrys (R. & P.) R. & S. Syst. Veg. 5: 194. 1819. *Psychotria macrobotrys* R. & P. Fl. 2: 57. *pl. 203, f. a.* 1799. *Palicourea lasioneura* Krause, Verh. Bot. Ver. Brandenb. 50: 112. 1908. *Palicourea acanthaceoides* Wernham, Journ. Bot. 55: 279. 1917.

A shrub or small tree, the branches glabrous or puberulent; stipule sheath 4 mm. long or less, truncate, the lobes subulate, equaling or longer than the sheath; leaves green, thin, short-petiolate, usually large, the blades oblong to ovate-oblong or lance-oblong, long-acuminate, usually finely and softly pubescent beneath over the whole surface, the veins inconspicuous; inflorescence elongate-

thyrsoid-paniculate, sessile or pedunculate, often pendent, the short, spreading branches puberulent, the flowers pedicellate; calyx lobes minute, acute; corolla about 1 cm. long, short-pilose, yellow or tinged with red; fruit purplish black, 4–5 mm. long. Neg. 608.

Ayacucho: Near Kimpitiriki, 400 meters, dense forest, *Killip & Smith 23018*. Estrella, 500 meters, *Killip & Smith 22622*.—Cuzco: Colpani, Urubamba Valley, 1,500 meters, *Cook & Gilbert 1046*. Quebrada de Quispicanchi, 3,250 meters, *Herrera 2612*.—Huánuco: Type from Cochero and Chinchao, *Ruiz & Pavón* (photo. seen ex hb. Berol.). Casapí, *Mathews 1947, 1946* (type collection of *P. acanthaceoides*). Posuso, 600 meters, *4599*. Pampayacu, *Kanehira 109*.—Junín: Vitoc, *McLean*. Valley of Mararioch, near Tarma, *Philippi*. Río Perené, *Killip & Smith 25143*. La Merced, 700 meters, *Killip & Smith 23471, 23937*. Río Paucartambo Valley, 700 meters, *Killip & Smith 25286*. Puerto Yessup, dense forest, 400 meters, *Killip & Smith 26231*.—Loreto: Rancho Indiana, *Mexia 6422*.—Puno: Chunchusmayo, *Weberbauer 1190*.—San Martín: Tarapoto, *Williams 6571; Ule 6629*, type of *P. lasioneura* (photo. and fragm. seen, ex hb. Berol.). San Roque, in forest, *Williams 7787, 7000*. Lamas, *Williams 6410*.—Without locality: *McLean; Mathews 1945*. Bolivia to Brazil and Colombia. "Quillo-sisa."

The branches of the inflorescence are pink or red.

Palicourea macrophylla (HBK.) Standl. Field Mus. Bot. 7: 321. 1931. *Nonatelia macrophylla* HBK. Nov. Gen. & Sp. 3: 423. 1819.

A shrub or tree 3.5–7.5 meters high with glabrous branches; stipules short, obtusely bilobate; leaves large, often somewhat blackened in drying, petiolate, elliptic or oblong-elliptic, mostly 17–25 cm. long and 10–16 cm. wide, abruptly short-acuminate, acute to rounded at the base, glabrous above, beneath glabrous or sparsely pubescent; inflorescence long-pedunculate, large, rather dense, thyrsiform-paniculate, the branches puberulent, the flowers pedicellate; calyx teeth acute; corolla 1 cm. long, yellow, or with yellow lobes and white tube, densely puberulent; fruit purple, subglobose, 4–5-celled.

Junín: Between Azupizú and Santa Rosa, 625 meters, dense forest, *Killip & Smith 26142*. Puerto Bermúdez, 375 meters, *Killip & Smith 26613*. San Nicolás, 1,100 meters, *Killip & Smith 26080*.—Loreto: Above Pongo de Manseriche, *Mexia 6225*. Bolivia to Brazil, British Guiana, and Venezuela.

Palicourea mitis (R. & P.) DC. Prodr. 4: 527. 1830. *Psychotria mitis* R. & P. Fl. 2: 60. *pl. 208, f. b.* 1799.

A shrub 4 meters high or less; stipules shallowly bilobate, the lobes rounded, appressed; leaves short-petiolate, subcoriaceous, brownish or yellowish when dried, the blades obovate or lance-oblong, medium-sized, acuminate, acute at the base, minutely appressed-pilose above and soft to the touch, beneath glabrous except along the costa, there sparsely pilose, the veins prominent and reticulate; panicles sessile or pedunculate, large and broad, open, the bracts subulate, the flowers sessile; calyx minute, 5-dentate; corolla yellow, about 1 cm. long, minutely and sparsely sericeous outside or glabrate; fruit oval, 4–5 mm. long, glabrous. Neg. 25808.

Cajamarca: Between Chuto and Cutervo, *Jelski 378.*—Amazonas: Entrada al valle de Huayabamba, Chachapoyas, *Raimondi 297.*—Huánuco: Type from Chacahuasi, near Pillao, *Ruiz & Pavón* (fragm. seen, ex hb. Berol.).—Junín: West of Huacapistana, 2,800 meters, *Weberbauer 2278.*

Palicourea nigricans Krause, Bot. Jahrb. 40: 428. 1908, nomen; Verh. Bot. Ver. Brandenb. 50: 112. 1908.

A nearly glabrous shrub or tree 3–6 meters high; stipules united into a sheath 3 mm. long, bilobate, the lobes broadly ovate, obtuse; leaves large, firm, usually blackening in drying, petiolate, the blades ovate-oblong to broadly elliptic or oval, 12–24 cm. long, 5–9 cm. wide, or larger, acuminate, acutish to rounded at the base, glabrous; panicles pedunculate, small, dense and compact, thyrsiform-paniculate, usually as broad as long, the branches ascending or spreading, glabrate; calyx teeth minute, acute; corolla dark blue, 12–15 mm. long, minutely papillose. Neg. 618.

Junín: Chanchamayo Valley, 1,200–1,500 meters, *Schunke 339, 1375* (form with narrow leaves; perhaps distinct).—Loreto: Cerro de Escalera, 1,200 meters, *Ule 6772*, type (photo. and fragm. seen, ex hb. Berol.). Yurimaguas, edge of forest, *Williams 3799, 4682.* Santa Rosa, forest, *Williams 4828.*—San Martín: Mainas Alto, *Poeppig.* Zepelacio, 1,200–1,600 meters, mountain forest, *Klug 3406.* Río Mayo, *Spruce 4437.* Also in Amazonian Brazil and Venezuela.

Palicourea obovata (R. & P.) DC. Prodr. 4: 527. 1830. *Psychotria obovata* R. & P. Fl. 2: 58. *pl. 204, f. a.* 1799. *Psychotria hyacinthiflora* R. & P. op. cit. 62. *pl. 213, f. a.* 1799. *Psychotria hyacinthoides* Pers. Syn. Pl. 1: 208. 1805. *Palicourea hyacinthiflora* R. & S. Syst. Veg. 5: 194. 1819.

A shrub or tree, sometimes 7.5 meters high, the branches glabrous; stipules bilobate, the lobes short, obtuse or rounded; leaves short-petiolate, coriaceous, yellowish green when dried, the blades elliptic to broadly obovate, often as much as 20 cm. long and 12 cm. wide, rounded and obtusely produced at the apex, cuneate at the base, more or less pilose beneath on the veins or glabrate, the nerves prominent; inflorescence short-pedunculate, narrowly pyramidal-paniculate, the stout branches spreading or even somewhat reflexed, glabrous or short-pilose; calyx with short, broad, rounded lobes; corolla blue or purple, about 13 mm. long, glabrous, the lobes spreading or reflexed; fruit globose, purple. Negs. 533, 597.

Huánuco: Described from forests of Chinchao and Pillao, *Ruiz & Pavón;* photo. and fragm. of presumably authentic material seen, ex hb. Berol. *P. hyacinthiflora* was based upon a drawing sent by Tafalla from Chicoplaya to Ruiz and Pavón; a specimen collected by Ruiz and labeled *Psychotria hyacinthiflora* is in hb. Berol., a photo. in hb. Field Mus.—Junín: Dos de Mayo, 1,800 meters, dense forest, *Killip & Smith 25790.*—San Martín: Tocache, *Poeppig 1996.*

Palicourea paraensis (Muell. Arg.) Standl. Field Mus. Bot. 11: 226. 1936. *Psychotria paraensis* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 245. 1881.

A slender shrub 2–3.5 meters high, the branches glabrous; stipules small, the short lobes triangular-subulate; leaves petiolate, membranaceous, green or blackish when dried, the blades oblong or lance-oblong, 5–14 cm. long, acute or acuminate, glabrous, sometimes slightly lustrous beneath, with 9–11 pairs of nerves; panicles short and ovoid or somewhat elongate, rather open, the branches glabrous or nearly so; calyx lobes minute, triangular, acute, usually rather conspicuously unequal; corolla red or orange, puberulent at the apex in bud, otherwise glabrous. Neg. 6096.

Loreto: San Antonio, *Williams 3359.* Caballo-cocha, in forest, *Williams 2472, 2275, 2287.* La Victoria, in or at edge of forest, *Williams 2725, 2901.* Río Itaya, *Killip & Smith 29538.* Pebas, *Williams 1841.* Río Putumayo, in clearing, *Klug 1623.* Also in Amazonian Brazil.

Psychotria subscandens Muell. Arg. probably is not distinct.

Palicourea perquadrangularis Wernham, Journ. Bot. 55: 341. 1917.

This species, which is common in Venezuela, was based by Wernham upon three collections from that country. With these he cited a specimen collected by Pearce at "Muña," believing that it was Venezuelan. The Peruvian collection should be examined further, in order to determine whether it really is referable to *P. perquadrangularis*, a reference that is probably incorrect.

Palicourea polyneura Krause, Notizbl. Bot. Gart. Berlin 8: 101. 1922.

A shrub 2 meters high with glabrous branches; stipule sheath 3–4 mm. long, the short lobes triangular-oblong, acute; leaves short-petiolate, coriaceous, fuscous when dried, the blades obovate or elliptic-obovate, 10–14 cm. long, 5–7 cm. wide, acuminate, pilose beneath on the veins; panicles thyrsoid, short and dense, the branches short-pilose, the flowers short-pedicellate; calyx lobes ovate-lanceolate, acute; corolla blue, 14–19 mm. long, glabrous; fruit 4–5 mm. long. Neg. 622.

Ayacucho: Above Yanamonte, 2,800 meters, *Weberbauer 5660*, type collection.

Palicourea ponasae Krause, Bot. Jahrb. 40: 431. 1908, nomen; Verh. Bot. Ver. Brandenb. 50: 114. 1908.

A slender shrub 2–4 meters high, the branches glabrous; stipule sheath short, truncate, the lobes linear-subulate; leaves slender-petiolate, membranaceous, elliptic-oblong or ovate-elliptic, 6–7.5 cm. long, 3 cm. wide, abruptly long-acuminate, glabrous; panicles lax, long-pedunculate, as much as 8 cm. long and usually broader, the pedicels 6–8 mm. long; calyx teeth short; corolla pale yellow, glabrous, 13–15 mm. long. Neg. 621.

Loreto: Cerro de Ponasa, 1,400 meters, *Ule 6776*, type (photo. and fragm. seen, ex hb. Berol.).

Palicourea punicea (R. & P.) DC. Prodr. 4: 526. 1830. *Psychotria punicea* R. & P. Fl. 2: 62. *pl. 212, f. a.* 1799. *Palicourea iquitoensis* Krause, Bot. Jahrb. 40: 401. 1908, nomen; Verh. Bot. Ver. Brandenb. 50: 115. 1908.

A shrub or a slender tree, 2–7.5 meters high, the branches glabrous or minutely puberulent, terete; stipule sheath short, the lobes lanceolate-attenuate, about 1 cm. long; leaves medium-sized or large, firm-membranaceous, often blackish when dried, oblong-ovate to oblong-lanceolate, mostly 15–25 cm. long, long-acuminate, glabrous; inflorescence long-pedunculate, cymose-corymbose, more

or less fastigiately branched, small, dense, the flowers short-pedicellate; calyx subtruncate, obsoletely crenate-dentate; corolla yellow or pink(?), reported also as red, glabrous, about 2 cm. long, the lobes often margined with red, the branches of the inflorescence orange. Negs. 624, 598.

Huánuco(?): Based upon a plate and description sent by Tafalla from San Antonio de Playa Grande; photo. seen of specimen in hb. Berol. labeled *Psychotria punicea* and collected by *Ruiz.*—Loreto: Type of *P. iquitoensis* collected near Iquitos, *Ule 6237;* photo. and fragm. seen, ex hb. Berol. Middle Ucayali, *Tessmann 624.* Near Iquitos, *Williams 1451, 1515, 1384, 8003, 3636; Killip & Smith 26932.* Mishuyacu, dense forest, *Killip & Smith 29865; Klug 1046.* —San Martín: Tarapoto, *Williams 5612, 5880.* Also in Bolivia.

Palicourea punoensis Standl. Field Mus. Bot. 11: 231. 1936.

A shrub with glabrous branches; stipules bilobate, the lobes triangular, acute; leaves short-petiolate, subcoriaceous, the blades narrowly lance-oblong, 8–13 cm. long, 2.5–3.5 cm. wide, long-acuminate, brownish when dried, beneath sparsely and minutely pilosulous, or hispidulous on the costa, the nerves about 17 pairs; inflorescence pedunculate, thyrsoid, dense, 2.5–4 cm. long, the branches hispidulous, the flowers sessile or nearly so; calyx teeth obtuse or acutish; corolla greenish, glabrous or sparsely hispidulous, 5–6 mm. long.

Puno: Between Tambo Yuncacoya and Tambo Cachicachi, on the road from Sandía to Chunchosmayo, 1,800–2,200 meters, *Weberbauer 1143.*

Palicourea Raimondii Standl. Field Mus. Bot. 8: 220. 1930.

Branches glabrous; stipule sheath short, the lobes linear-subulate, 1 cm. long; leaves short-petiolate, thick-coriaceous, the blades elliptic or elliptic-oval, 9–14 cm. long, 4–7 cm. wide, acute or short-acuminate, obtuse or rounded at the base, dark brown when dried, glabrous, the nerves about 15 pairs; inflorescence short-pedunculate, pyramidal, cymose-paniculate, 8 cm. long, the branches sparsely ferruginous-villosulous, the flowers sessile or nearly so; calyx shortly obtuse-dentate; corolla yellow, in bud 3.5–4 mm. long, sparsely and minutely villosulous.

Puno: Road from Sandía to Valle Grande, between Entre Ramos and Yuncacoya, *Raimondi 11114,* type.

Palicourea saligna Standl. Field Mus. Bot. 4: 340. 1929.

A glabrous shrub or small tree; stipule sheath 1–1.5 mm. long, truncate, the 4 remote teeth triangular, acute; leaves short-petiolate, firm, the blades lanceolate, 3–6 cm. long, 1–1.8 cm. wide, narrowly attenuate-acuminate, the nerves about 8 pairs; inflorescence long-pedunculate, corymbiform, lax, few-flowered, the flowers pedicellate; calyx lobes rounded-ovate, apiculate; fruit 5 mm. long.

Cuzco: In forest below Pillahuata, Cerro de Cusilluyoc, 2,300 meters, *Pennell 13978*, type.

Palicourea sandiensis Krause, Bot. Jahrb. 40: 337. 1908.

A shrub 3 meters high with glabrous branches; stipules short, shallowly bifid, 4 mm. long; leaves short-petiolate, subcoriaceous, the blades lanceolate or linear-lanceolate, 10–15 cm. long, 2–3 cm. wide, long-acuminate, long-attenuate to the base, glabrous; panicles long-pedunculate, small, glabrous, sometimes as much as 10 cm. long, the flowers long-pedicellate; calyx obsoletely dentate; corolla yellow, glabrous, 12–14 mm. long; fruit globose, 4 mm. in diameter. Neg. 630.

Puno: Between Tambo Azalaya and Tambo Ichubamba, on the road from Sandía to Chunchosmayo, *Weberbauer 1111*, type (photo. in hb. Field Mus.). Sandía, *Raimondi 11118*.

Palicourea stenoclada (Muell. Arg.) Standl. Field Mus. Bot. 8: 380. 1931. *Psychotria stenoclada* Muell. Arg. in Mart. Fl. Bras. 6, pt. 5: 254. 1881.

A slender shrub 1–3.5 meters high, the branches puberulent or glabrate; stipule sheath short, the short lobes triangular and acute or subulate; leaves short-petiolate, membranaceous, green when dried, the blades ovate-lanceolate, 7–14 cm. long, long-acuminate, puberulent beneath, especially on the veins, with about 10 pairs of nerves; peduncles much elongate, the inflorescence corymbiform, fastigiately branched, small and dense, the branches puberulent or glabrate; calyx lobes triangular, acute; corolla yellow, with red-margined lobes, 14–15 mm. long, glabrous; branches of the inflorescence orange-red. Neg. 641.

Loreto: Leticia, in forest, *Williams 3052*. Mishuyacu, *Klug 750*. Nazarete, *Osgood 18, 21*. "Amazonas," *Ule 5127a*. Yurimaguas, 135 meters, dense forest, *Killip & Smith 27695*. Between Yurimaguas and Balsapuerto, *Killip & Smith 28135*.—San Martín: Zepelacio, *Klug 3315*. Also in Amazonian Brazil.

Palicourea subspicata Huber, Bol. Mus. Paraense 4: 613. 1906.

A shrub or small tree 1–7.5 meters high, glabrous outside the inflorescence; stipules 5 mm. long, bilobate, the lobes very obtuse; leaves large, petiolate, green or blackish when dried, the blades membranaceous, elliptic to ovate, mostly 20–25 cm. long, acute or short-acuminate; inflorescence long-pedunculate, spike-like or raceme-like, elongate, puberulent, the flowers pedicellate; calyx shallowly dentate, the lobes broad, erose; corolla variously described as orange, scarlet, or pink, sparsely puberulent, 15 mm. long.

Junín: Puerto Yessup, 400 meters, dense forest, *Killip & Smith 26259.*—Loreto: Cerro de Canchahuaya, *Huber 1415*, type (photo. and fragm. seen ex hb. Pará). Recreo, in forest, *Williams 4000, 3927.* Between Yurimaguas and Balsapuerto, 150 meters, dense forest, *Killip & Smith 28102.* Mouth of Río Santiago, *Mexia 6192a.*—San Martín: Pongo de Cainarachi, *Klug 2645, 2766.* Amazonian Brazil.

The species is set apart from all others by its narrow, elongate inflorescence.

Palicourea sulphurea (R. & P.) DC. Prodr. 4: 528. 1830. *Psychotria sulphurea* R. & P. Fl. 2: 58. *pl. 205, f. a.* 1799.

A shrub, glabrous throughout or nearly so; stipules 6–10 mm. long, shallowly bilobate, the lobes rounded; leaves petiolate, coriaceous, yellowish green when dried, the blades broadly obovate, acute or abruptly short-acuminate, about 13 cm. long and 8 cm. wide; panicles ovoid-pyramidal, large, open, the flowers short-pedicellate or sessile; calyx lobes minute, rounded; corolla yellow, 8 mm. long; fruit blackish. Neg. 532.

Huánuco: Described from Pillao and Iscutuna, *Ruiz & Pavón* (photo. and fragm. seen, ex hb. Berol.) Pampayacu, 1,050 meters, *5108.*

Palicourea triphylla DC. Prodr. 4: 526. 1830. *P. stenostachys* Krause, Bot. Jahrb. 40: 340. 1908.

A low shrub, usually about 1 meter high, the branches terete, glabrous or sparsely puberulent; stipule lobes linear-attenuate, about 6 mm. long; leaves ternate, almost sessile, yellowish when dried, often subcoriaceous, oblong or lance-oblong, long-acuminate, puberulent, especially beneath, or finally glabrate; inflorescence long-pedunculate, thyrsoid-paniculate, often somewhat elongate, dense and many-flowered, short-pilose; calyx lobes obtuse; corolla fur-

furaceous-puberulent, yellow, 12–15 mm. long; fruit black. Negs. 639, 6668.

Junín: La Merced, 600 meters, granitic cliff, *5332*. Chanchamayo Valley, 1,200 meters, *Schunke 337*. Puerto Bermúdez, 375 meters, dense forest, *Killip & Smith 26407*.—Loreto: Santa Ana, *Williams 1237*. Palta-cocha, in forest, *Williams 790, 1263*.—San Martín: Type of *P. stenostachys* from open thickets near Moyobamba, 900 meters, *Weberbauer 4474;* photo. and fragm. seen, ex hb. Berol. Moyobamba, *Mathews* in 1838. San Roque, *Williams 7276*. Tarapoto, *Williams 5980*. Lamas, *Williams 6388*. Widely distributed in tropical America.

Easily distinguished by the ternate leaves, although all the leaves on some specimens may be opposite.

Palicourea Weberbaueri Krause, Bot. Jahrb. 54: Beibl. 119: 40. 1916.

A shrub 2–4 meters high, with glabrous branches; stipule sheath 3 mm. long, the setiform lobes 4–5 mm. long; leaves short-petiolate, blackish or brownish when dried, subcoriaceous, the blades ovate or ovate-lanceolate, 6–10 cm. long, 3–4.5 cm. wide, acuminate, short-pilose beneath on the veins; inflorescence pyramidal-corymbiform, 5–8 cm. long, pedunculate, dense, the branches glabrous or nearly so, the flowers pedicellate; calyx lobes minute, ovate, acute; corolla greenish blue, 9–12 mm. long, glabrous. Neg. 652.

Piura: Western slopes of the Andes above Palambla, 2,700 meters, *Weberbauer 6042*, type collection.

74. PAEDERIA L.

Suffrutescent vines, ill-scented; stipules broad, truncate, connate with the petioles; leaves opposite, long-petiolate, membranaceous; flowers small, cymose-paniculate, axillary and terminal, 5-parted; calyx 5-dentate or 5-parted, persistent, the lobes equal or unequal; corolla tubular, villous in the throat, the short lobes recurved, valvate in bud; stamens inserted in the corolla throat, with short filaments; fruit 2-celled, dry, compressed, the thin epicarp separating from the 1-seeded nutlets.

Paederia diffusa (Britton) Standl. Field Mus. Bot. 7: 330. 1931. *Lygodisodea foetida* R. & P. Fl. 2: 48. *pl. 188*. 1799, non *P. foetida* L. 1767. *Disodea foetida* Pers. Syn. Pl. 1: 210. 1805. *Manettia diffusa* Britton, Bull. Torrey Club 18: 107. 1891. *P. olens* Schum. in E. & P.

Nat. Pfl. 4. Abt. 4: 125. 1897. *Poederiopsis diffusa* Rusby, Bull. N. Y. Bot. Gard. 4: 373. 1907.

A large, more or less woody vine, nearly glabrous; leaves on long, slender petioles, the blades elliptic-ovate to ovate-oblong, 5.5–10 cm. long, acuminate, acute to cordate at the base; corolla deep purple or reddish, 6–8 mm. long; calyx lobes ovate, acutish; fruit oblong to elliptic, 10–13 mm. long.

Cuzco: San Miguel, Urubamba Valley, 1,800 meters, *Cook & Gilbert 1155*.—Huánuco: Type material of *L. foetida* from Muña and Posuso, *Ruiz & Pavón*. Muña, 2,100 meters, *3995*.—Junín: La Merced, 600 meters, in hedgerows on sandy flat, *5316; Killip & Smith 23460, 24054*. Also in Bolivia and Argentina.

Ruiz and Pavón give the vernacular name as "yurahuanium," and state that the tough stems were used as a substitute for rope and twine. The vernacular names "bejuco hediondo" and" bejuco blanco" also are reported.

75. CORYNULA Hook. f.

Slender perennial herbs with opposite leaves; stipules 3–5-lobate; flowers axillary, pedicellate; hypanthium turbinate; calyx 5-parted, the lobes subulate-lanceolate, unequal; corolla narrowly funnelform, glabrous in the throat, the 5 lobes short, erect, obtuse, valvate; stamens inserted in the base of the tube, the anthers exserted; fruit pyriform, coriaceous, 5-costate, finally separating into 2 one-seeded cocci.

Corynula pilosa (Benth.) Hook. f. in Hook. Icon. 12: 22. *pl. 1123*. 1876. *Mitchella pilosa* Benth. Pl. Hartw. 194. 1845.

Plants prostrate, branched, the slender branches pilose; leaves short-petiolate, the blades ovate to rounded-ovate, 6–12 mm. long, acute or acutish, abruptly contracted at the base, hispidulous beneath; pedicels solitary, longer than the petioles; corolla about 8 mm. long; fruit 4–5 mm. long, long-attenuate at the base, appressed-pilosulous.

Libertad: Río Mixiollo, *Weberbauer 7028*. Also in Bolivia and Ecuador.

76. GOMOZIA Mutis

Creeping, perennial herbs; stipules connate with the petioles into a sheath, bidentate or entire and triangular; leaves small, opposite; flowers minute, axillary, sessile; calyx truncate or dentate, persistent; corolla tubular or funnelform, glabrous in the throat, the 4

lobes valvate in bud; stamens inserted at the base of the corolla, the filaments filiform, the anthers exserted; fruit drupaceous, containing two 1-seeded nutlets.

Gomozia granadensis L. f. Suppl. 129. 1781. *Nertera depressa* Banks & Soland. ex Gaertn. Fruct. 1: 124. *pl. 26*. 1788. *N. repens* R. & P. Fl. 1: 60. *pl. 90, f. b*. 1798.

Plants small and slender, almost glabrous, forming dense, close mats on banks and logs, the stems much branched; leaves petiolate, the blades rather thick, mostly 5 mm. long or less, ovate to ovate-rounded, obtuse, puncticulate above; corolla white or greenish yellow; fruits bright red, juicy, 3–4 mm. long.

Ayacucho: Choimacota Valley, 3,000 meters, *Weberbauer 7535*. —Cuzco: Pillahuata, Cerro de Cusilluyoc, 2,300 meters, in forest, *Pennell 13975*.—Huánuco: Type material of *N. repens* from Huasahuasi and Muña, *Ruiz & Pavón*. Six miles south of Mito, 3,000 meters, wet slope, *1833*. Huacachi, 1,950 meters, in forest, *4116*. Widely distributed in the higher mountains of Central and South America.

The plant is a handsome one when in fruit, in appearance suggestive of the partridge-berry (*Mitchella repens*) of the United States.

77. EMMEORRHIZA Pohl

Perennials, more or less scandent, herbaceous or somewhat suffrutescent, the stems obtusely 4-angled; stipules united with the petioles to form a setiferous sheath; leaves more or less plicate-nerved; hypanthium turbinate; sepals 4, almost distinct; corolla short-funnelform, the 4 lobes valvate; stamens long-exserted; capsule 2-celled, coriaceous, the valves bifid at the apex; seeds spuriously winged by the adherent, spongious placenta.—The genus consists of a single variable species.

Emmeorrhiza umbellata (Spreng.) Schum. in Mart. Fl. Bras. 6, pt. 6: 408. 1889. *Borreria umbellata* Spreng. Neue Entd. 2: 144. 1821. *Endlichera umbellata* Schum. in Mart. Fl. Bras. 6, pt. 6: 38. *pl. 74*. 1888.

A slender vine as much as 2 meters long with elongate branches, the stems glabrous or puberulent; leaves oblong-lanceolate to elliptic, 4.5–10 cm. long, acuminate, attenuate at the base to a short petiole, yellowish green, glabrous or pubescent; inflorescence a large, somewhat leafy panicle, the flowers in small, many-flowered umbels;

sepals ovate-triangular or subulate; corolla white, 1–2 mm. long; capsule obconic, glabrous or pubescent, 1.5–3 mm. long.

Ayacucho: Carrapa, 1,200 meters, wooded hillside, *Killip & Smith 22444*.—Huánuco: Cuschi, 1,500 meters, sunny edge of montaña along stream, *4839*.—Junín: La Merced, 600 meters, shaded river cliff, *6348; Killip & Smith 23799, 23671*. Above San Ramón, 1,400–1,700 meters, *Killip & Smith 24564*. Huacapistana, *1,800*–2,400 meters, *Killip & Smith 24158*. Chanchamayo Valley, 1,200 meters, *Schunke 155, 156, 1623*. Chanchamayo, *Martinet 1450*. Eneñas, 1,700 meters, *Killip & Smith 25779*. Colonia Perené, 680 meters, in thickets, *Killip & Smith 25010*.—San Martín: Tarapoto, *Spruce 4572*. Bolivia and Argentina to Brazil and Colombia.

The plant may be recognized at once by its umbellate flowers and scandent habit.

78. MITRACARPUS Zucc.

Annual or perennial herbs; stipules united with the petioles to form a setiferous sheath; leaves opposite, commonly narrow; flowers minute or small, in terminal or axillary heads, 4-parted; sepals 4, unequal, connate below; corolla funnelform, the lobes valvate in bud; stamens included or subexserted, inserted in the mouth of the corolla; fruit 2-celled, transversely or obliquely circumscissile.

Plants perennial; corolla much longer than the calyx. . *M. frigidus.*

Plants annual; corolla not exceeding the calyx. . . . . *M. hirtus.*

Mitracarpus frigidus (Willd.) Schum. in Mart. Fl. Bras. 6, pt. 6: 81. 1888. *Spermacoce frigida* Willd. ex R. & S. Syst. Veg. 3: 531. 1818.

A stout perennial, often much branched, the quadrangular stems puberulent or hispidulous; leaves short-petiolate or almost sessile, lanceolate or lance-oblong, acute or acuminate, acute at the base, pubescent, conspicuously nerved; flowers white, in very dense, rounded, sessile, axillary and terminal heads. Neg. 909.

Cajamarca: Cutervo, *Raimondi 4149; Jelski 117*. Bolivia and Brazil to the Guianas and Colombia.

Mitracarpus hirtus (L.) DC. Prodr. 4: 572. 1830. *Spermacoce hirta* L. Sp. Pl. ed. 2. 148. 1762.

Plants annual, erect or ascending, simple or more often much branched, usually less than 50 cm. high, the branches puberulent or villous, slender; leaves subsessile, lanceolate to ovate-oblong, acute,

2–5 cm. long; flowers densely clustered in the leaf axils and at the ends of the branches; corolla white, 1–2 mm. long; capsule subglobose, bisulcate, short-pilose, 0.8 mm. long or less. Neg. 910.

Cuzco: Hacienda Chancamayo, *Herrera 2453b.*—Huánuco: Huánuco, 2,100 meters, stony slopes, *3204.*—Junín: Chanchamayo Valley, 1,200 meters, *Schunke 1449.*—Puno: Sandía, *Weberbauer 579.*—San Martín: Tarapoto, sandy soil, *Williams 6163.*—Without locality: *Weberbauer 6468.* Generally distributed in tropical America.

79. RICHARDIA L.

Erect or prostrate annuals, usually with rough pubescence; stipules connate with the petioles into a setiferous sheath; leaves opposite; flowers small or rather large, densely crowded in terminal involucrate heads; ovary 3–4-parted; sepals 4–6, more or less connate at the base; corolla funnelform, the lobes valvate in bud; fruit consisting of 3–4 indehiscent 1-seeded cocci.

Carpels of the fruit 4; sepals 4.

Bracts of the involucre linear, coriaceous, with strongly revolute margins..... *R. rigidifolia.*

Bracts ovate, herbaceous, not or scarcely revolute... *R. humistrata.*

Carpels 3; sepals 6.

Fruit not muriculate; corolla pink..... *R. rosea.*

Fruit muriculate.

Carpels acutely carinate on the inner face..... *R. lomensis.*

Carpels sulcate on the inner face..... *R. scabra.*

Richardia humistrata (C. & S.) Steud. Nom. Bot. ed. 2. 2: 459. 1841. *Richardsonia humistrata* C. & S. Linnaea 3: 353. 1828.

Plants apparently perennial, with short, repent branches from the base, the stems spreading-pilose; leaves lanceolate or oblong-lanceolate, 10–17 mm. long, acute, appressed-villous; bracts broadly ovate; sepals ovate-triangular, acute; corolla 2 mm. long, hirsute; carpels plane on the inner face, 2–3 mm. long.

Cajamarca: Cutervo, *Raimondi 5689.* Also in Brazil and Uruguay.

Richardia lomensis (Krause) Standl. Field Mus. Bot. 8: 386. 1931. *Richardsonia lomensis* Krause, Bot. Jahrb. 40: 348. 1908.

A low annual 2–5 cm. high, hispid throughout; leaves ovate or ovate-oblong, 1–2.5 cm. long, acuminate, contracted at the base

into a short petiole; heads few-flowered; sepals oblong, acute; corolla white, glabrous outside, 4–4.5 mm. long; carpels 4 mm. long, incised at the base. Neg. 855.

Arequipa: Mollendo, in sandy places, 100 meters, *Weberbauer 1542* (photo. and fragm. of type seen, ex hb. Berol.).

Richardia rigidifolia (Krause) Standl. Field Mus. Bot. 8: 386. 1931. *Richardsonia rigidifolia* Krause, Notizbl. Bot. Gart. Berlin 8: 103. 1922.

A low perennial, densely branched from the base, the stems hispidulous or glabrate; leaves coriaceous, linear or linear-lanceolate, 12–18 mm. long; heads few-flowered; corolla greenish yellow, 3–4 mm. long; carpels normally 4, smooth and glabrous. Neg. 854.

Ayacucho: Ayacucho, on rocky cliffs, 3,100 meters, *Weberbauer 5502* (photo. and fragm. of type seen, ex hb. Berol.).—Junín: Mountains east of Palca, 2,800 meters, *Weberbauer 2437*.

Richardia rosea (St. Hil.) Schult. f. Syst. Veg. 7: 88. 1829. *Richardsonia rosea* St. Hil. Pl. Usu. *pl. 7*. 1824.

A prostrate annual, villous or pilose throughout; leaves oblong-lanceolate to oval, 2–5 cm. long, acute, attenuate to the base and contracted into a short petiole; heads dense, subtended by 2 or 4 bracts; sepals subulate; corolla 5–6 mm. long, hirsute; carpels pilose, 4 mm. long. Neg. 849.

Cuzco: Hacienda Chancamayo, *Herrera 2454a*. Also in Brazil and Argentina.

Richardia scabra L. Sp. Pl. 330. 1753. *R. pilosa* R. & P. Fl. 3: 50. 1802. *Richardsonia scabra* St. Hil. Pl. Usu. *pl. 8*. 1824.

A prostrate or ascending annual, often forming mats, pilose or hispid throughout; leaves petiolate, the blades oblong or lanceolate, 2–9 cm. long, acute and mucronate; heads dense and few- or many-flowered; sepals lanceolate; corolla 4–6 mm. long; carpels 2–3 mm. long.

The species is a widely distributed weed of tropical America. I have seen no Peruvian specimens, but it is included here on the authority of Schumann, who referred *Richardia pilosa* to its synonymy. That species of Ruiz and Pavón was described from Cercado, Huánuco, Chancay, and Lima. If it was found by those early collectors at so many stations, it is strange that it has not been rediscovered in recent years.

80. DIODIA L.

Annual or perennial herbs, sometimes suffrutescent at the base; stipules united with the petioles to form a setiferous sheath; leaves opposite, usually small and narrow; flowers minute or small, axillary or in spicate or cymose inflorescences; sepals 2 or 4, equal or unequal; corolla funnelform, 4-lobate, the lobes valvate; stamens inserted in the mouth or throat of the corolla, the anthers dorsifixed; fruit of 2 carpels, indehiscent, the carpels usually separating from the persistent column, membranaceous to woody.

Flowers all axillary.

Stems glabrous or finely puberulent; leaves glabrous except on or near the margins; fruit puberulent at the apex. *D. hyssopifolia.*

Stems hirsute or pilose; leaves densely scabrous; fruit usually hispid or hispidulous..... *D. teres.*

Flowers arranged in cymes or elongate spikes.

Flowers in few-flowered clusters, these arranged in cymes. *D. dichotoma.*

Flowers in dense heads, these forming interrupted spikes. *D. alata.*

Diodia alata Nees & Mart. Act. Soc. Nat. Cur. 12: 12. 1824. *D. palustris* C. & S. Linnaea 3: 347. 1828.

A creeping perennial, nearly glabrous, the stout stems rooting, 4-angled and more or less winged on the angles; leaves subsessile, ovate or elliptic to suborbicular, acutish, nearly glabrous above, aculeolate beneath on the prominent nerves; flower heads sessile or short-pedunculate, large and many-flowered, globose; corolla white, 1.5–2 mm. long; capsule glabrous, 1.5 mm. long. Neg. 6690.

Cuzco: Cosñipata, 1,400 meters, *Weberbauer 6941*. Also in Brazil and Colombia, growing usually in wet soil.

Diodia polymorpha C. & S. var. *microphylla* C. & S. is reported from Peru by Schumann (in Mart. Fl. Bras. 6, pt. 6: 12. 1888), but the record evidently is based upon a specimen from eastern Brazil.

Diodia dichotoma (HBK.) Schum. in Mart. Fl. Bras. 6, pt. 6: 11. 1888. *Spermacoce dichotoma* HBK. Nov. Gen. & Sp. 3: 348. 1819. *D. glabra* Willd. ex R. & S. Syst. Veg. 3: 532. 1818, non Pers. 1805. *Borreria dichotoma* C. & S. Linnaea 3: 340. 1828. *Triodon laxum* Spruce ex Schum. loc. cit. in syn.

Plants small, erect, suffrutescent, usually less than 30 cm. high, the stems branched, glabrous; leaves lanceolate or oblong-lanceolate, 1–2 cm. long, acuminate, mucronate, scabrous above, especially toward the margin, pilosulous beneath on the veins or glabrous; cymes trichotomous; sepals 2; corolla 2 mm. long; capsule glabrate. Neg. 862.

Amazonas: Chachapoyas, *Mathews 1502.*—Cajamarca: Cutervo, *Raimondi 3745.*—Piura: Ayavaca, *Humboldt & Bonpland* (photo. of type, ex hb. Berol., seen). Ranging to Ecuador.

Schumann (in Mart. Fl. Bras. 6, pt. 6: 11. 1888) reports *Spruce 5997* from "Peruvia orientali." The specimen of this number that I have seen is labeled as having been collected in the Andes of Ecuador.

Diodia hyssopifolia (Willd.) C. & S. Linnaea 3: 350. 1828. *Spermacoce hyssopifolia* Willd. ex R. & S. Syst. Veg. 3: 532. 1819.

An erect perennial 60 cm. high or less, often densely branched, sometimes suffrutescent below; stems dark ferruginous; leaves linear, 2–5 cm. long, acuminate, attenuate at the base, the margins often revolute; flowers densely clustered in the leaf axils; hypanthium pilosulous near the apex; sepals 4, subulate, acute; corolla white, 3–4 mm. long; capsule 3–4 mm. long. Negs. 6733, 864.

Loreto: Banks of the Río Itaya above Iquitos, 110 meters, *Killip & Smith 29402.* Extending to Brazil, the Guianas, and Colombia.

Diodia teres Walt. Fl. Carol. 87. 1788. *D. prostrata* Sw. Prodr. Fl. Ind. Occ. 30. 1788.

An erect annual, the stems simple or branched, usually less than 50 cm. high; leaves linear or lance-linear, 1.5–4.5 cm. long, thick-margined, acuminate, distant, spreading or ascending; flowers axillary, solitary or geminate, sessile or nearly so; sepals unequal; corolla 3–4 mm. long, white or pink; fruit 3 mm. long, the carpels rounded on the back.

Piura: Serrán, southeast of Piura, *Weberbauer 5987, 5979.* Ranging northward to the United States; common in many parts of tropical America, usually in savannas or grassland.

81. HEMIDIODIA Schum.

Perennial herbs, sometimes suffrutescent at the base; stipules united with the petioles into a setiferous sheath; leaves opposite; flowers clustered in the leaf axils, sessile; sepals 4, equal, connate at

the base; corolla funnelform, the 4 lobes valvate; stamens inserted in the mouth of the corolla, exserted; fruit of 2 carpels, these separating from the central septum, opening near the base.—The genus consists of a single species.

Hemidiodia ocimifolia (Willd.) Schum. in Mart. Fl. Bras. 6, pt. 6: 29. 1888. *Spermacoce ocimifolia* Willd. ex R. & S. Syst. Veg. 3: 530. 1818.

Stems often much elongate, decumbent or ascending, sparsely puberulent or glabrate; leaves petiolate, lanceolate or lance-oblong, 3–5 cm. long or larger, acuminate, puberulent or glabrate, scabrous on the margins, often plicate-nerved; flowers in dense, axillary clusters; sepals ovate, acute, 0.5 mm. long; corolla white or bluish, glabrous, 3–4 mm. long; fruit 3–4 mm. long, puberulent or glabrous. Negs. 6713, 6738.

Cajamarca: Prov. Cantumasá, *Raimondi 7526*.—Loreto: near Iquitos, *Williams 1370*. Pebas, in forest, *Williams 1952, 1581*. Río Itaya, *Williams 37, 196, 157*. Paraíso, Alto Itaya, *Williams 3206*.—San Martín: San Roque, in forest, *Williams 7191, 7166, 7094*. Lamas, *Williams 6366*. Widely distributed in tropical America.

The plant is a common weed in many parts of the lowlands of tropical America, often growing abundantly in cultivated ground.

82. SPERMACOCE L.

Erect or ascending annuals; stipules connate with the petioles into a setiferous sheath; leaves opposite, herbaceous; flowers minute, densely clustered in the leaf axils, 4-parted; sepals short-connate; corolla funnelform, the lobes valvate in bud; stamens attached at the base of the corolla tube, the anthers versatile; fruit dry, of 2 one-seeded carpels, these coherent by the base, one carpel opening, the other remaining closed.

Capsule glabrous; leaves glabrous on the upper surface or scabrous only on the margins.....*S. glabra.*

Capsule pubescent; leaves scabrous on the upper surface. .*S. confusa.*

Spermacoce glabra Michx. Fl. Bor. Amer. 1: 82. 1803.

Plants simple or branched, erect to procumbent, the stems glabrous; leaves short-petiolate, lanceolate or linear-lanceolate, 3–6 cm. long, acuminate; inflorescences many-flowered, one-sided; sepals

triangular, 1 mm. long; corolla white, 2 mm. long; capsule obovoid, 3 mm. long.

Lima: Lima, dry places, in 1862, *Nation.*—Piura: Serrán, 250 meters, *Weberbauer 5987.* Widely distributed in tropical America, extending northward to the southeastern United States.

Spermacoce confusa Rendle, Journ. Bot. 74: 12. 1936. *Spermacoce tenuior* Auct., non L.

Plants erect or spreading, 60 cm. high or less, often much branched, the stems scabrous, hispidulous, or sometimes glabrous; leaves ovate-lanceolate to linear-lanceolate, 2–7 cm. long, acuminate, scaberulous beneath; inflorescences several-flowered; sepals ovate-triangular; corolla white or purplish, glabrous; capsule subglobose, 2 mm. long.

Amazonas: Chachapoyas, *Mathews.*—Huánuco: Huánuco, 2,100 meters, shale and gravel slopes, *3219.* Generally distributed in tropical America as a weed.

83. BORRERIA G. Mey.

Plants low, annual or perennial, sometimes suffrutescent, erect or prostrate; stipules connate with the petioles into a setiferous sheath; leaves often plicate-nerved, opposite; flowers small, usually sessile in the leaf axils or in terminal heads; sepals 2 or 4, equal or unequal, often with interposed teeth; corolla funnelform, 4-lobate; stamens usually attached in the throat of the corolla; fruit a coriaceous or membranaceous capsule, 2-celled, the cells septicidal; seed one in each cell.

Inflorescence cymose, composed of few stalked heads. . *B. corymbosa.*

Inflorescence of simple, bracted heads, or the flowers densely clustered in the leaf axils.

Stigma bifid at the apex; plants bright yellowish green when dried.

Flowers appearing verticillate in the leaf axils. . . . *B. latifolia.*

Flowers not verticillate, crowded in unilateral clusters subtended by 4 large leaves. . . . . *B. alata.*

Stigma capitate; plants not yellow-green when dried.

Flower clusters small, about 5 mm. in diameter; a slender annual. *B. ocimoides.*

Flower clusters large, mostly 8–15 mm. in diameter; plants usually perennial.

Sepals minute, broadly triangular; leaves mostly ovate or oblong-ovate. Seeds transverse-sulcate.....*B. laevis.*

Sepals elongate, linear-subulate; leaves mostly linear to narrowly lanceolate.

Seeds transversely sulcate; plants usually copiously pubescent.....*B. capitata.*

Seeds not transversely sulcate; plants commonly almost glabrous.....*B. suaveolens.*

Borreria alata (Aubl.) DC. Prodr. 4: 544. 1830. *Spermacoce alata* Aubl. Pl. Guian. 1: 60. *pl. 22, f. 7.* 1775.

Plants yellow-green, much branched, prostrate and rooting, the stout branches 4-angled and more or less winged on the angles, ciliate on the wings or glabrate; leaf blades elliptic to ovate, 2–4 cm. long, rather thick, conspicuously nerved; flower clusters about 1 cm. in diameter; sepals as long as the hypanthium, oblong or oblong-lanceolate, acute; corolla 4 mm. long; capsule 2 mm. long.

Loreto: Near Iquitos, a weed in pasture, *Williams 1487.* Caballococha, on the Amazon, in forest, *Williams 2033.* Río Itaya, *Williams 139.* Also in Brazil and the Guianas.

Borreria capitata (R. & P.) DC. Prodr. 4: 545. 1830. *Spermacoce capitata* R. & P. Fl. 1: 61. *pl. 91, f. b.* 1798.

A coarse erect perennial, 1 meter high or less, usually much branched, the branches pubescent or tomentose; leaves mostly 3–10 cm. long, acute or acuminate, acute at the sessile base, scaberulous above, puberulent or short-pilose beneath, plicate-nerved; flowers densely crowded in large, terminal and axillary heads 8–16 mm. in diameter; sepals subulate, ciliate, equaling the hypanthium; corolla white or pinkish, 2–6 mm. long; capsule about 2 mm. long. Neg. 25583.

Huánuco: Type from Pillao and Iscutuna, *Ruiz & Pavón* (authentic material seen, ex hb. Berol.)—Junín: Chanchamayo Valley, 1,200–1,500 meters, *Schunke 1574, 434, 359.* San Ramón, open hillside, 900–1,300 meters, *Killip & Smith 24787.* Widely distributed in South America.

Called "poaya" and "poaya do campo" in Brazil, and said to be used there sometimes as a substitute for ipecac.

Borreria corymbosa (R. & P.) DC. Prodr. 4: 550. 1830. *Spermacoce corymbosa* R. & P. Fl. 1: 60. *pl. 91, f. a.* 1798. *S. peruviana*

Pers. Syn. Pl. 1: 124. 1805. *Bigelowia corymbosa* Bartl. ex DC. loc. cit., as syn. *Hedyotis spermacocea* Dombey ex DC. loc. cit., as syn.

Plants erect, suffrutescent, stiff, 60 cm. high or less, the branches glabrous; leaves linear or linear-lanceolate, 1–2 cm. long, acute at each end, somewhat coriaceous, with revolute margins; flower heads about 6–8 mm. in diameter, the flowers sessile or short-pedicellate; sepals triangular, half as long as the hypanthium; corolla white, 2–3 mm. long, villous in the throat; capsule glabrous, obovoid or turbinate, 2 mm. long. Neg. 873.

Huánuco: Originally described from Muña, Cormilla, and Rinconada, *Ruiz & Pavón.* Tambillo, 2,400 meters, rocky grassy slope, *3574.* Also in Brazil, Argentina, and Bolivia.

Schumann (in Mart. Fl. Bras. 6, pt. 6: 70. 1888) reports from Peru a closely related species, *B. centranthoides* C. & S., but his report is based upon a Bolivian specimen.

Borreria laevis (Lam.) Griseb. Goett. Abh. 7: 231. 1857. *Spermacoce laevis* Lam. Ill. 1: 273. 1791. *S. assurgens* R. & P. Fl. 1: 60. *pl. 92, f. c.* 1798.

Plants herbaceous, annual or sometimes perennial, erect or ascending, usually less than 60 cm. high, the branches glabrous or puberulent on the angles; leaves herbaceous, mostly 2.5–5 cm. long, acute or acuminate, abruptly decurrent at the base into a long, slender petiole, more or less pilose, especially on the nerves, or glabrate; flower heads sessile, terminal and axillary, the terminal ones subtended by large leaves; hypanthium puberulent at the apex; corolla white, 2–2.5 mm. long; capsule 2 mm. long, the calyx lobes obscure at maturity; seeds castaneous. Negs. 886, 6700.

Cuzco: Valle Lares, *Diehl 2403d.*—Junín: Río Pinedo, north of La Merced, in clearing, 800 meters, *Killip & Smith 23595.* Chanchamayo Valley, 1,200 meters, *Schunke 377.*—Libertad: Trujillo, roadside, *Killip & Smith 21506.*—Lima: *S. assurgens* was described from Lima, Chancay, and Huánuco, *Ruiz & Pavón.* Lima, in 1852, *Andersson.* Santa Clara, *Rose 18728.*—Loreto: Recreo, Yurimaguas, in chácara, *Williams 4157.* Above Pongo de Manseriche, *Mexia 6362.* Río Putumayo, *Klug 1643.* Santa Rosa, Yurimaguas, in pasture, *Williams 4835.*—Tumbes: Plain east of Hacienda La Choza, 100–200 meters, *Weberbauer 7702.*—San Martín: Zepelacio, *Klug 3327.* Distributed almost throughout tropical America.

The species is one of the most common weeds of many parts of the tropical American lowlands. Killip reports that the plant is

crushed with a composite and applied to cuts as an aid in healing them.

Borreria latifolia (Aubl.) Schum. in Mart. Fl. Bras. 6, pt. 6: 61. *pl. 80.* 1888. *Spermacoce latifolia* Aubl. Pl. Guian. 55. *pl. 19, f. 1.* 1775.

Plants perennial, herbaceous or suffrutescent, prostrate or ascending, often much branched, conspicuously yellowish when dried, the stout branches 4-angled and often narrowly winged above, glabrous or pubescent on the angles; leaves thick, elliptic to oblong, nearly sessile, 3.5–7 cm. long, acute or acuminate, acute at the base, more or less scaberulous or puberulent, at least on the nerves; hypanthium glabrous or pilose; sepals ovate-lanceolate, acute, ciliate, 2 mm. long; corolla white or blue, 4–6 mm. long; capsule 3 mm. long. "Siuca blanca," "gallinazo," "carmelo." Negs. 6694, 6691.

Loreto: Nauta(?), *Raimondi 2171.* Iquitos, 120 meters, *Williams 8090; Killip & Smith 27014.* Nanay Hills, *Williams 265.* Mishuyacu, in clearing, *Klug 185, 332.* La Victoria, on the Amazon, *Williams 2574.* Widely distributed in tropical America.

Borreria ocimoides (Burm.) DC. Prodr. 4: 544. 1830. *Spermacoce ocimoides* Burm. Fl. Ind. 34. *pl. 13, f. 1.* 1768. *S. gracilis* R. & P. Fl. 1: 61. *pl. 92, f. a.* 1798.

Plants slender, usually much branched, sometimes 60 cm. high but often 10 cm. high or less, erect to prostrate, the stems glabrous or puberulent on the angles; leaves elliptic to linear-lanceolate, 1–3 cm. long, acute, attenuate at the base to a short petiole or sessile, glabrous or somewhat scabrous near the margins; hypanthium minute, glabrous or puberulent; sepals about equaling the hypanthium, subulate; corolla white, shorter than the calyx; capsule scarcely 1 mm. in diameter.

Huánuco: Type of *S. gracilis* from Huánuco, *Ruiz & Pavón.*—Junín: La Merced, 1,200 meters, a weed in garden, *5672.* East of Quimirí Bridge, near La Merced, in clearing, *Killip & Smith 23968.* Near Perené Bridge, Paucartambo Valley, 700 meters, moist bank, *Killip & Smith 25384.* Yapas, 1,400 meters, *Killip & Smith 25596.* —Loreto: La Victoria, on the Amazon, in pasture, *Williams 2648.* Río Itaya, *Williams 239.* Yurimaguas, edge of forest, *Williams 4099.* Río Mazán near Iquitos, *Williams 8127.* Mishuyacu, 100 meters, *Klug 525.*—San Martín: Tarapoto, *Williams 5878.* San

Roque, 1,400 meters, *Williams 7444, 7454.* Generally distributed as a weed in the lowlands of tropical America.

Borreria suaveolens G. Mey. Prim. Fl. Esseq. 81. *pl. 1.* 1818. *Spermacoce tenella* HBK. Nov. Gen. & Sp. 3: 345. 1819. *B. tenella* C. & S. Linnaea 3: 317. 1828.

Plants perennial, erect to procumbent, usually much branched, 1 meter high or less, the older stems usually ferruginous, often somewhat woody, the younger ones usually glabrous; leaves sessile, acute or acuminate, often revolute, 2–8 cm. long, glabrous or scabrous, sometimes sparsely pilose; flower heads 8–12 mm. thick, mostly terminal and subtended by leaves; hypanthium villosulous; sepals longer than the hypanthium, ciliate; corolla white, 2.5–5 mm. long; capsule oblong, pubescent at the apex, 2 mm. long. Negs. 6697, 6702, 887.

Amazonas: Chachapoyas, 2,700 meters, a common weed, *Williams 7567.* Between Levanto and Suta, *Raimondi 450.*—Ayacucho: Aina, 800 meters, *Killip & Smith 23173.*—Huánuco: Panao, 2,700 meters, grassy slopes, *3611.*—Junín: Chanchamayo Valley, 1,200 meters, *Schunke 1407.*—San Martín: Lamas, 840 meters, *Williams 6367, 6443.* Mt. Moro, Moyobamba, *Weberbauer 4592.* Zepelacio, 1,200–1,600 meters, *Klug 3359.* Widely distributed in tropical America, usually at middle or higher elevations.

Spermacoce erioclada DC. Prodr. 4: 557. 1830. *S. scaberrima* Bartl. ex DC. loc. cit. in syn.

Plants ascending, suffrutescent, the stems hirsute-tomentose; leaves oblong, scabrous; flower heads terminal; calyx lobes 4; stamens exserted.

Described from Peru. Probably a *Borreria,* and perhaps a synonym of *B. capitata;* at least the description indicates no distinguishing characters. *S. erioclada* var. *linearifolia* DC. loc. cit., described from Peru, is a form with linear leaves.

Spermacoce inconspicua Bartl. ex DC. Prodr. 4: 557. 1830.

Suffrutescent; stems glabrous below, pulverulent above; leaves linear-oblong, glabrous, the margin scabrous; flower heads terminal; calyx lobes 4, acuminate.

Type from the mountains of Peru. Doubtless a *Borreria;* perhaps a synonym of *B. suaveolens.*

84. SHERARDIA L.

Small annuals; leaves verticillate, narrow; flowers small, subsessile, in terminal and axillary, involucrate heads; calyx segments 4–6, persistent; corolla funnelform, the tube equaling or longer than the lobes; stamens inserted in the tube, the anthers exserted; fruit 2-celled, didymous, the carpels indehiscent.

Sherardia arvensis L. Sp. Pl. 102. 1753.

Stems hispidulous, short or elongate and branched; leaves in whorls of 4–6, obovate to lanceolate or linear, acute and mucronate, 6–15 mm. long, ciliate; flower heads pedunculate; corolla pink or bluish.

Junín: Ocopa, rocky stream bed, 3,300 meters, *Killip & Smith 21997*. Native of Europe, but sometimes naturalized in America.

85. RELBUNIUM Hook. f.

Annual or perennial herbs, resembling *Galium* in habit; leaves verticillate; flowers minute, the pedicel articulate with the involucre, this consisting of 2–4 leaf-like bracts; ovary didymous; sepals none; corolla rotate, 4-lobate, the lobes valvate in bud; stamens exserted; fruit more or less fleshy and juicy, smooth or tuberculate, usually 2-seeded.

Involucre of only 2 bracts. Ovary hispid..... *R. ericoides.*

Involucre of 4 bracts.

Fruit and ovary pilose..... *R. hypocarpium.*

Fruit and ovary glabrous.

Leaves oval to orbicular, 3–10 mm. wide, 3-nerved.... *R. ovale.*

Leaves linear or oblong, less than 3 mm. wide, 1-nerved.

Stems glabrous..... *R. ciliatum.*

Stems puberulent or pilose.

Stems puberulent or scaberulous; leaves merely ciliate. *R. croceum.*

Stems pilose; leaves often pilose as well as ciliate.

Plants 5 cm. high or less, dense, compactly branched; leaves merely ciliate..... *R. corymbosum.*

Plants with elongate, slender branches; leaves usually pilose on the surfaces as well as ciliate.. *R. hirsutum.*

Relbunium ciliatum (R. & P.) Hemsl. Biol. Centr. Amer. Bot. 2: 62. 1881. *Galium ciliatum* R. & P. Fl. 1: 59. 1798. *Rubia ciliata* DC. Prodr. 4: 591. 1830. *Rubia monantha* DC. loc. cit. *G. monanthon* Bartl. ex DC. loc. cit. in syn. *Relbunium tarmense* Krause, Bot. Jahrb. 40: 351. 1908.

Plants low and densely branched, the slender stems glabrous; leaves in 4's, oblong or linear, mostly 3–4 cm. long, usually ciliate, mucronate-acute; corolla greenish yellow; flowers axillary and solitary; fruit glabrous, fleshy. Neg. 950.

Ancash: Hacienda Cajabamba, 3,700 meters, *Weberbauer 3060.* —Ayacucho: Ayacucho, *Weberbauer 5500.*—Cajamarca: Cutervo, *Raimondi 5682.*—Cuzco: Cuzco, in 1916, *Watkins; Weberbauer 4869.* Quebrada de Miscahuara, 3,350 meters, *Herrera 636.* Paucartambo Valley, 3,500 meters, *Herrera 1416a.* Pucará, 3,700 meters, *Weberbauer 430.*—Huánuco: Tambo de Vaca, 3,900 meters, wet mossy rocky uplands, *4359.*—Junín: Described from Tarma, Chancai, and Cheuchín, *Ruiz & Pavón.* Tarma, 2,100 meters, heavy stony soil, *1011.* Oroya, *Kalenborn 52.* Tarma, *Weberbauer 2408,* type of *R. tarmense.*—Lima: Obrajillo, *Wilkes Exped.* Antaicocha, 3,500 meters, sandy and gravelly stream wash, *Pennell 14629.* Matucana, 2,400 meters, rock crevices and loose shale slopes, *235; Savatier 400.* —Puno: Chuquibambilla, 3,900 meters, crevices of limestone rock, *Pennell 13407.* Ranging to Colombia and Chile.

In the synonymy of this species probably belong the following names: *Galium mucronatum* R. & P. Fl. 1: 60. 1798, non L. *G. apiculatum* R. & S. Syst. Veg. 3: 222. 1818, non Sibth. *G. leucocarpum* DC. Prodr. 4: 612. 1830. *Rubia mucronata* H. & A. Bot. Misc. 3: 363. 1833. *G. tarmense* Spreng. Syst. Veg. 1: 387. 1825. The type was collected at Tarma by Ruiz and Pavón. Schumann considered this and *R. ovale* as probably identical, but in the latter the leaves are oval, rather than linear, as described for *Galium mucronatum.* I have seen no material of the Ruiz and Pavón plant, and their description is far from satisfactory, hence it may be that the name refers to some species other than *Relbunium ciliatum.*

Relbunium corymbosum (R. & P.) Schum. in Mart. Fl. Bras. 6, pt. 6: 118. 1888. *Galium corymbosum* R. & P. Fl. 1: 59. 1798. *Rubia corymbosa* DC. Prodr. 4: 591. 1830.

Plants perennial, dwarf and compact, with slender, ascending branches, sometimes corymbosely branched; leaves lance-oblong to elliptic-oblong, minute, acute or obtuse, long-ciliate; flowers solitary,

the pedicels half as long as the leaves or shorter; fruit apparently white, glabrous.

Junín: Type from Bombóm in the mountains of Tarma, *Ruiz & Pavón.* Between Tarma and Jauja, 4,500 meters, *Killip & Smith 21970.* Cerro de Pasco, 4,200 meters, crevices of limestone outcrop, *3069.*

It is rather doubtful whether this species, or at least the specimens here referred to it, differs essentially from *R. hirsutum.*

Relbunium croceum (R. & P.) Schum. in Mart. Fl. Bras. 6, pt. 6: 116. 1888. *Galium croceum* R. & P. Fl. 1: 59. 1798. *Rubia crocea* DC. Prodr. 4: 591. 1830. *G. chloranthum* Krause, Bot. Jahrb. 40: 351. 1908.

Plants perennial, the numerous short stems prostrate or ascending, densely leafy; leaves in 4's, linear or lance-oblong, subcoriaceous, usually scaberulous and ciliate; flowers solitary, short-pedicellate; corolla glabrous; fruit reddish yellow, glabrous. Neg. 941.

Huánuco: Originally described from Tarma, Huánuco, Rondos, and Nauyan, *Ruiz & Pavón.* Mito, 3,150 meters, grassy uplands, *1878, 1877.*—Junín: Oroya, *Weberbauer 2584,* type of *R. chloranthum.*—Puno: Araranca, 4,200 meters, crevices of siliceous rock, *Pennell 13469.* Also in Bolivia.

This so-called species is not separated sharply from *R. hirsutum,* and probably should be treated as a form or variety of it.

Relbunium ericoides (Lam.) Schum. in Mart. Fl. Bras. 6, pt. 6: 109. 1888. *Galium ericoides* Lam. Encycl. 2: 583. 1788.

A rather stout perennial, erect or ascending, sometimes suffrutescent at the base, the stems short-pilose; leaves triangular-ovate, acuminate, 1.5–2.5 mm. long, glabrous or sparsely pilose; flowers axillary in 2's or 3's; corolla 1 mm. broad; fruit hirtous, 2 mm. broad.

Reported from Peru by Schumann, loc. cit., on the basis of a specimen collected by Haenke. Also in Brazil, Chile, and Uruguay.

The report of this species from Peru needs confirmation, and I am skeptical as to its occurrence in the country.

Relbunium hirsutum (R. & P.) Schum. in Mart. Fl. Bras. 6, pt. 6: 116. 1888. *Galium hirsutum* R. & P. Fl. 1: 59. 1798. *Rubia hirsuta* Schlecht. ex Wedd. Chlor. And. 2: 37. 1857, in syn.

A low perennial, the stems numerous, prostrate or ascending, usually 20 cm. long or less, short-pilose; leaves lanceolate to ovate-oblong, acute, mostly short-hirsute, subcoriaceous, blackish when

dried; flowers solitary in the leaf axils, equaling or shorter than the leaves; corolla greenish white; fruit glabrous, white. Neg. 943.

Arequipa: Mollendo, *Rose 19485.*—Ayacucho: Pampalca, 3,200 meters, *Killip & Smith 23293, 22267.*—Cajamarca: Chota, *Jelski 5491.* Montaña de Nanchó, 2,300 meters, *Raimondi 3235.* Cutervo, *Raimondi 3044.*—Huánuco: Huánuco, *Ruiz.* Mito, 2,700 meters, among grasses on shrubby slope, *1612.* Puente de Esperanza, *Kanehira 284.*—Junín: La Oroya, 3,600 meters, limestone cliffs, *938; Kalenborn 52.*—Lima: Lima, *Wilkes Exped.* Río Blanco, 3,600 meters, open, steep banks, *670; Killip & Smith 21551.* Chicla, *Rose 18684.* Type from Cullnay and Obrajillo, *Ruiz & Pavón.*—Puno: Araranca: 4,200 meters, crevices of siliceous rock, *Pennell 13468, 13469.* Argentina to Colombia.

Relbunium hypocarpium (L.) Hemsl. Biol. Centr. Amer. Bot. 2: 63. 1881. *Vaillantia hypocarpia* L. Syst. Nat. ed. 10. 1307. 1759.

A weak perennial with elongate stems sometimes as much as 1 meter long or more, sometimes subscandent, the branches retrorse-hispidulous; leaves in 4's, oblong to elliptic or obovate, 5–15 mm. long, mucronate, narrowed to the base, more or less pilose and ciliate, rather thick, the margins revolute; flowers pedicellate, equaling or shorter than the leaves; corolla white, 1–1.5 mm. broad; fruit orange-red, 2–3 mm. long. Neg. 6717.

Arequipa: Mollendo, *Hitchcock 22380.*—Cuzco: Valle de San Miguel, 2,400 meters, *Herrera 2011.* Without locality, *Herrera 2536.* Cerro de Cusilluyoc, 2,300 meters, in forest, *Pennell 14018.*—Huánuco: Cani, 2,550 meters, steep, open slope among shrubs, *3453.* Mito, 2,700 meters, among shrubs, *1372.* Pampayacu, *Kanehira 87.* Llata, 2,100 meters, *2285.* Twelve miles south of Panao, 3,000 meters, moist, shady bank in forest, *2204.*—Junín: Huacapistana, 1,800–2,400 meters, open hillside, *Killip & Smith 24233.* Above San Ramón, 1,300–1,700 meters, *Schunke A16.*—San Martín: San Roque, 1,400 meters, *Williams 7381, 7455, 7698.* Zepelacio, 1,200–1,600 meters, *Klug 3276.* Widely distributed in the mountains of tropical America, at middle or high elevations.

Known at Mito as "antanco," and used there for dyeing cloth. The genus *Relbunium* is closely related to *Rubia* of the Old World, which furnishes madder dye.

Relbunium ovale (R. & P.) Schum. in Mart. Fl. Bras. 6, pt. 6: 115. 1888. *Galium ovale* R. & P. Fl. 1: 59. 1798. *Rubia ovalis*

DC. Prodr. 4: 591. 1830. *Relbunium diffusum* Schum. op. cit. 111. 1888.

Plants large and rather coarse, much branched, the stems sometimes as much as 1 meter long, hirsute or glabrate; leaves in 4's, 5–20 mm. long, obtuse or mucronate, contracted at the base and short-petiolate, ciliate and pilose; flowers long-pedicellate, the foliaceous bracts 3–4 mm. long; corolla greenish, 1.5 mm. broad; fruit white, glabrous, 3 mm. broad.

Ayacucho: Aina, 750–1,000 meters, in clearing, *Killip & Smith 22617*.—Cajamarca: Chorrillos, *Raimondi 6870*.—Cuzco: Chaupichaca, 1,700 meters, *Weberbauer 7827*. Matariata, 650 meters, *Bues 2869*.—Huánuco: Originally described from Chancay, Huánuco, and Lima, *Ruiz & Pavón*. Huánuco, *Ruiz* (fragm. ex hb. Berol.).—Junín: Chanchamayo Valley, 1,200 meters, *Schunke 1541*. Also in Bolivia, Brazil, and Argentina.

The plant is yellowish green when dried, specimens of other species usually turning blackish.

86. GALIUM L.

Annuals or perennials, herbaceous or suffrutescent, the stems 4-angled; leaves verticillate; flowers minute, 3–4-parted, arranged in axillary and terminal cymes, ebracteate, the calyx jointed with the pedicel; calyx obsolete; corolla rotate, the lobes valvate; stamens 3–4, the filaments short, the anthers didymous, exserted; ovary 2-celled, with 2 short styles; fruit didymous, dry or fleshy.

Fruit glabrous.....*G. pumilio.*

Fruit pubescent.

Plants annual; leaves in whorls of 6–8, linear or oblanceolate-linear.....*G. Aparine.*

Plants perennial; leaves mostly in whorls of 4, sometimes in 6's.

Hairs of the fruit dense, straight, much longer than the diameter of the fruit.....*G. eriocarpum.*

Hairs of the fruit uncinate at the apex, little if at all longer than the diameter of the fruit.

Leaves glabrous beneath.....*G. limense.*

Leaves sparsely or densely pilose or hispidulous beneath.

Branches pubescent with chiefly weak and spreading, lax hairs.....*G. canescens.*

Branches retrorse-aculeolate.....*G. ferrugineum.*

Galium Aparine L. Sp. Pl. 108. 1753.

A slender, weak annual with elongate stems, the branches uncinulate; leaves in 6's or 8's, narrow, pale green, 1–3 cm. long or even larger, cuspidate-acuminate, hispidulous on the upper surface, the margins and the costa uncinulate; flowers whitish or yellowish; fruit dry, uncinate-hispid.

Arequipa: Nevado de Chachani, 3,600 meters, *Pennell 13270.*—Ayacucho: Pampalca, 3,200 meters, open hillside, *Killip & Smith 22261.*—Cuzco: Cuzco, 3,300 meters, *Herrera 534.* Calca, 3,000 meters, *Herrera 2077.* Near Tinta, 3,500 meters, *Cook & Gilbert 209.*—Junín: Tarma, 3,100 meters, shaded stream bank, *Killip & Smith 21901.*—Lima: Matucana, 2,400 meters, trailing on steep shale slope, *127.* San Gerónimo, 150 meters, on rock slide, *5893.* Río Blanco, 3,600 meters, in rocks near stream, *657.* Canta, 3,100 meters, open, rocky banks, *Pennell 14613.* Cerro de Amancaes, *Raimondi 12383.* Río Blanco, 3,200 meters, open hillside, *Killip & Smith 21596.* Chicla, 3,600–3,900 meters, in 1882, *Ball.* Baños, *Wilkes Exped.* Lima, *Rose 18607.* Widely distributed in cooler regions of South America; also in North America and the Old World.

Galium canescens HBK. Nov. Gen. & Sp. 3: 336. 1819. *G. obovatum* HBK. loc. cit. *pl. 277.* 1819. (?) *G. lappaceum* R. & P. Fl. 1: 59. 1798.

A lax perennial, much branched, the slender, angled stems pilose with weak, whitish hairs, or these sometimes deciduous in age; leaves in 4's, ovate to elliptic or obovate, mostly 5–15 mm. long, obtuse to acuminate, acute at the base, usually densely pilose on both surfaces, sometimes glabrate, 3-nerved; corolla yellowish or whitish, sometimes reddish brown, the lobes caudate-acuminate; fruit dry, densely uncinate-hispid. Neg. 923.

Ayacucho: Mountains near Huanta, 3,200 meters, *Weberbauer 7516.* Carrapa, 1,000 meters, wooded hillside, *Killip & Smith 22511.*—Cuzco: Without locality, *Herrera 2588.*—Huancavelica: Above Huaitara, 2,800 meters, *Weberbauer 5420.*—Huánuco: Fifteen miles southeast of Huánuco, 3,150 meters, shady, moist thicket, *2112.* Muña, 2,100 meters, shady slope, *3916.* Llata, 2,100 meters, shaded cliff ledges, *2234.* Cani, 2,550 meters, *3386.* Huacachi, 1,950 meters, open bank, *4133.*—Junín: Camino entre Junín y la Montaña, *Raimondi 11891.*—La Oroya, 3,600 meters, limestone cliffs, *937.* Between Viques and Ingahuasi, 3,150 meters, open, rocky hillside, *Killip & Smith 22146.*—Lima: Obrajillos, *Wilkes Exped.*

Matucana, 2,400 meters, steep, rocky slope, *87, 556.* San Lorenzo, *Gaudichaud* in 1836. Matucana, *Martinet 51.* San Buenaventura, 2,700 meters, open, rocky slope, *Pennell 14519.*—Moquehua: Carumas, 3,200 meters, climbing in shrubs, *Weberbauer 7294.* Ranging to Bolivia and Colombia.

The species is a somewhat variable one as to leaf form and size and in pubescence. I have been unable to find any good character for distinguishing *G. canescens* and *G. obovatum,* although these two species usually have been considered distinct. The type of *G. lappaceum* R. & P. (non Salisb. 1796) was collected at Cerro Puelles, Huánuco.

Pennell 13861 from the Department of Cuzco was distributed as *Galium Closianum* Briq., a Chilean species, but that number is really *Arcytophyllum filiforme* (R. & P.) Standl.

Galium dasycarpum Kunze ex Walp. Nov. Act. Nat. Cur. 19: Suppl. 1: 357. 1843, listed as from Peru, is a mere name.

Galium eriocarpum Bartl. ex DC. Prodr. 4: 600. 1830.

Plants slender, suffrutescent, the stems glabrous or scaberulous; leaves small, in 4's, ovate or oblong-ovate, obtuse or acutish, scabrous or hirtellous; flowers in small, dense, terminal cymes; fruit dry, covered with very long and soft, pale, spreading hairs.

Arequipa (?): "Mont Guancac," *Haenke.*—Puno: Lake Titicaca, *Meyen.*—Department uncertain: "Mont Oravio," *Haenke.* Also in Chile and Argentina.

Galium ferrugineum Krause, Bot. Jahrb. 40: 349. 1908. *G. Weberbaueri* Krause, loc. cit. *G. andicolum* Krause, op. cit. 350.

A slender perennial with weak, elongate stems; leaves in 4's or 6's, ovate to elliptic or obovate, 4–10 mm. long or larger, acuminate or mucronate, sparsely or rather densely pilose; flowers in small, axillary or terminal cymes, the corolla green to reddish brown; fruit dry, densely uncinate-pilose. Negs. 918, 927, 934.

Ancash: Below Hacienda Cajabamba, 3,000–3,500 meters, *Weberbauer 3123,* type of *G. andicolum.* Ocros, 3,100 meters, *Weberbauer 5800.*—Cajamarca: Above San Pablo, 2,400–2,700 meters, *Weberbauer 3807,* type of *G. ferrugineum.*—Lima: Along the railroad between Lima and Oroya, 2,400–3,000 meters, *Weberbauer 204, 205,* type of *G. Weberbaueri.*—Department unknown: Without locality, *Weberbauer 5420.*

I have seen type material of the three species referred here, and fail to find any important differences between them, if any at all. It is probable that all three names should be reduced further to synonymy under *G. canescens*.

Galium limense Standl. Field Mus. Bot. 4: 298. 1929.

A diffuse, procumbent perennial, the stems sparsely uncinulate; leaves in 4's, oblong-ovate, 5–8 mm. long, acuminate, obtuse at the base, 3-nerved, scaberulous above; cymes 3-flowered, axillary and terminal; corolla green; fruit dry, densely uncinate-hispidulous.

Lima: Canta, 2,800 meters, open, rocky slope, *Pennell 14351*, type.

This, too, probably is a mere form of *G. canescens*.

Galium pumilio Standl. Field Mus. Bot. 4: 298. 1929.

A diminutive, densely matted, compact herb, the stems 1–4 cm. long, glabrous; leaves in 4's or 6's, usually longer than the internodes, oblong or ovate, 1.5–2.5 mm. long, obtuse or acutish, glabrous, ciliate; flowers axillary, solitary, on pedicels 4–8 mm. long; fruit fleshy, glabrous.

Junín: Cerro de Pasco, grassy limestone slope, 4,200 meters, *Macbride 3070*, type.

Doubtful genus

Riqueuria avenia R. & P. Fl. 1: 70. 1798. *Riqueuria* R. & P. Prodr. 18. 1794.

A procumbent shrub, the stem branched, the branches naked below; leaves opposite, petiolate, the blades oblong, entire, glabrous, not nerved; racemes short, terminal; pedicels 3-flowered; corolla yellow, fleshy.—Growing in the forests of Chinchao and Cochero, especially near Casapí and Casapillo.

The genus has been referred generally to the Rubiaceae, but its proper position has not been suggested. The group is altogether doubtful.

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